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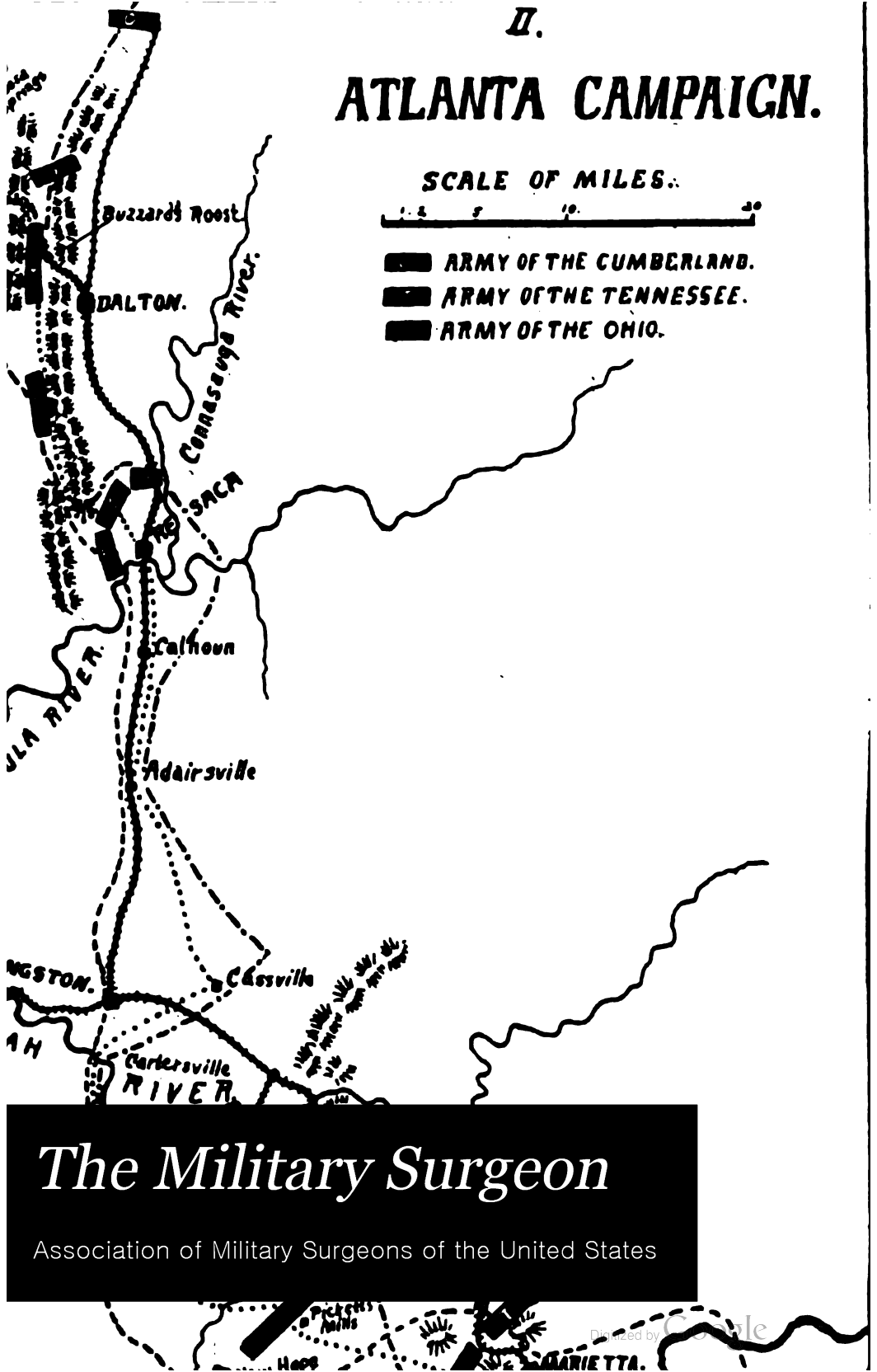

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OF THE UNITED STATES

EDITED BY

CHARLES LYNCH

VOLUME XXXI

WASHINGTON, D. C.
THE ASSOCIATION OF MILITARY SURGEONS
1912

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22nd Annual Meeting, Denver, Colo.

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MILITARY ABSENTEEISM IN WAR, WITH SPECIAL REFERENCE TO THE RELATION OF THE MEDICAL DEPARTMENT THERETO. [CONCLUDED]

BY MAJOR EDWARD L. MUNSON, MEDICAL CORPS; DIRECTOR, FIELD SERVICE SCHOOL FOR MEDICAL OFFICERS, THE ARMY SERVICE SCHOOLS, FORT LEAVENWORTH, KANSAS.

ABSENTEEISM DUE TO UNNECESSARY DISCHARGES ON SURGEONS' CERTIFICATES OF DISABILITY.

BUT the evils connected with the care of the supposedly sick and disabled in the Civil War did not end with the wrongful entry on sick report of the latter, their removal to distant points, their absenteeism under authority of sick furloughs injudiciously granted, or with the delay in sending them back to their proper organizations. Vast numbers of men were unnecessarily or fraudulently discharged on surgeon's certificate of disability, and thus not only needlessly lost to the army, but subsequently added to the pension rolls. The surgeons and civilian doctors who served as the agents in this wholesale disintegration of armies very likely took credit to themselves for meritorious humanitarianism. Certainly they would have resented being regarded as anything else but patriotic. Yet their acts lacked only intent to be treasonable. Every unnecessary discharge of a soldier at their hands

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was equivalent to adding a rifle to the firing line of the enemy. The following figures would indicate that they were a very real, if unwitting, agent in the unnecessary prolongation of the war and its agonies.

The Medical and Surgical History of the Civil War gives the following data:

Discharges on Surgeon's Certificate of Disability.

TROOPS	May and June, 1861	July 1, 1861 to June 30, 1862	July 1, 1862 to June 30, 1863	July 1, 1863 to June 30, 1864	July 1, 1864 to June 30, 1865	July 1, 1865 to June 30, 1866
White	908	28,620	103,772	33,877	38,645	9,480
Colored				874	4,340	3,009
Total	908	28,620	103,772	34,761	42,985	12,489

The grand total for discharges on Surgeon's Certificate of Disability was thus 223,525. For comparison, it is interesting to note that report of the Provost Marshal General, dated March 17, 1866, gives the following summary of other causes of loss:

Died of wounds	34,773
Died of disease	183,287
Deserted	199,045
Killed in action	61,362

The loss in military strength through discharge on surgeon's certificate thus exceeded those from deaths through wound or illness combined, was far greater than that due to desertion, and was nearly four times the number of those killed in action. In one year, the losses through this channel nearly equaled one and one-half times the total strength of the present regular army of the United States. In the year 1863, one man out of every six was discharged as being physically unfit to further bear arms. What wonder that General Pope complained that the doctors were stealing away his army!

It is idle to assume that even the majority of such appalling losses at the hands of the medical profession were based on equity. Some of the chief causes of discharge on surgeon's certificate were as follows:

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Rheumatism	11,779
Heart Disease	10,636
Diarrhoea	16,185
Debility	14,500
Epilepsy	3,872
Bronchitis	3,729
Varicose veins	2,038
Varicocele	1,415
Piles	1,598

To a medical officer, the causes given in the above list as the excuse for such wholesale discharges are, to say the least, very far from convincing. Many of them are of such nature as to present conditions largely invisible and subjective and the existence of which could only be inferred through the soldier's statements; when objective symptoms were presented, they were often of such nature that their disabling character must remain largely problematical and open to justifiable suspicion.

The War Department seemed powerless to stop the abuse, though it seemed aware of it, for G. O. 65, W. D., June 12, 1862, states that: "No discharges will be given on account of rheumatism or where there is a prospect of recovery within a reasonable time." Even at the very outset of the war the possible magnitude of the evil seemed to have been foreseen, and the following orders were then issued:

GENERAL ORDERS, No. 39.

WAR DEPT., ADJ'T. GENERAL'S OFFICE, WASHINGTON, *July* 1, 1861.

I. No volunteer will be discharged upon surgeon's certificate of disability until the certificate shall have been submitted to the Medical Director, and shall have been approved and countersigned by him.

* * * * * * *

GENERAL ORDERS, No. 51.

WAR DEPARTMENT, Adjutant General's Office, WASHINGTON, *August* 3, 1861.

I. Hereafter when volunteers are to be mustered into the service of the United States, they will at the same time be minutely examined by the surgeon and assistant surgeon of the regiment, to ascertain whether they have the physical qualifications necessary for the military service.

* * * * * * *

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GENERAL ORDERS,
No. 104.

HEADQUARTERS OF THE ARMY,
Adjutant General's Office,
WASHINGTON, *December* 3, 1861.

The attention of officers of the Army is invited to the following, in addition to the orders of the Secretary of War embraced in the regulations for the recruiting service:

I. The large number of enlisted men discharged on "certificates of disability" has attracted the notice of the General-in-Chief, and as it is an especial duty to render the rank and file of the Army as effective as possible, the attention of superintendents and other officers concerned either with the enlistment of men or their discharge on account of disability is directed to the judicious discharge of their respective duties.

* * * * *

But the power of discharge for disability, apparently as the result of political pressure, was soon extended to the surgeons in command of hospitals, for which the following order was an entering wedge:

GENERAL ORDERS,
No. 36.

WAR DEPARTMENT,
Adjutant General's Office,
WASHINGTON, *April* 7, 1862.

* * * * *

2. The Chief Medical Officer, to whom the charge of all the General Hospitals in the city may be entrusted, will cause certificates of disability to be made out for such men as, in his judgment, should be discharged. He will be responsible that the certificates are given for good cause, and that they are made in proper form, giving such medical description of the cases, with the degree of disability, as may enable the Pension Office to decide on any claim to pension which may be based upon them. The certificates of disability will be signed by the Chief Medical Officer, and forwarded by him to the Military Commander in the city, who shall have authority to order the discharge and dispose of the case according to existing regulations.

* * * * *

This concession, however, did not satisfy the needs of those interested, for one or another reason, in getting soldiers discharged from the service under conditions securing them in pension rights, and Congress itself thus took a hand in the matter, as follows:

GENERAL ORDERS,
No. 53.

WAR DEPARTMENT,
Adjutant General's Office,
WASHINGTON, *May* 16, 1862.

The following acts of Congress are published for the information of all concerned:

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* * * * * * *

II. AN ACT to facilitate the discharge of enlisted men for physical disability.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Medical Inspector-General or any medical inspector is hereby authorized and empowered to discharge from the service of the United States any soldier or enlisted man, with the consent of such soldier or enlisted man, in the permanent hospitals, laboring under any physical disability which makes it disadvantageous to the service that he be retained therein, and the certificate, in writing, of such inspector-general or medical inspector, setting forth the existence and nature of such physical disability, shall be sufficient evidence of such discharge: *Provided, however,* That every such certificate shall appear on its face to have been founded on personal inspection of the soldier so discharged, and shall specifically describe the nature and origin of such disability; and that such discharge shall be without prejudice to the right of such soldier or enlisted men to the pay due him at the date thereof, and report the same to the Adjutant-General and the Surgeon-General.

Approved May 14, 1862.

By order of the Secretary of War:

L. THOMAS,
Adjutant-General.

Further action by the War Department soon followed which practically removed the last barrier to any absentee desirous of at once escaping from his military obligations and procuring a pension from the Government, as follows:

GENERAL ORDERS,
No. 65.

WAR DEPARTMENT,
Adjutant General's Office,
WASHINGTON, *June* 12, 1862.

* * * * *

Immediately upon receipt of this order, each Military Commander will publish, three times, in some newspaper, a brief notice requiring all United States soldiers in that city and country around, who are not under treatment in a United States hospital, to report themselves to him without delay on penalty of being considered deserters. In cases of serious disability from wounds or sickness, which may prevent obedience to this requirement, the soldier must furnish a certificate of a physician in good standing, describing his case, on which, if satisfactory, the Military Commander may grant a written furlough for not exceeding thirty days, or a discharge on the prescribed form of a certificate of disability, made out strictly according to the Regulations.

* * * * *

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Under this order, all that the discontented or designing had to do was to go absent without leave, send in a certificate of disability procurable from any civilian quack doctor for a few dollars, or forge one for himself if of frugal mind, and receive in return an honorable discharge providing him with an income for life and rendering him free to return to civil pursuits without fear of interruption, or to return to the Army under an assumed name in the lucrative business of bounty jumping. Why incur the dangers and ignominy of desertion when credulous or dishonest doctors could be so readily deceived or bought, and an honorable and profitable exit was so conveniently provided! Within a year the number of discharges on surgeon's certificates quadrupled, and within two months the following order indicates that the War Department began to appreciate the Pandora's Box of evils which an untrained Medical Department and profession had opened:

GENERAL ORDERS,
100.

WAR DEPARTMENT,
Adjutant General's Office,
WASHINGTON, *August* 11, 1862.

* * * * * * *

VI. Where troops are serving in an army corps, or an army, no leaves of absence will be granted on the certificate of a regimental or brigade surgeon till the same has been approved by the medical director of such army corps or army; and no medical director will endorse any certificate until he has made a personal examination of the applicant, or received a favorable report from a medical officer appointed by him to make such personal examination. And if upon such personal examination it be found that the certificate of disability was given without proper cause, the name of the medical officer giving it will be reported to the Adjutant General of the Army, in order that he may be dismissed from the service.

* * * * * * *

It may here be parenthetically mentioned for comparison with the mild punishment of dismissal deemed appropriate above, that it is reported of General Linevitch in the late Russo-Japanese War, that to stop the prevailing evil of absenteeism operating through the Russian medical service he ordered a medical officer convicted of having issued a fraudulent sick leave of absence to be taken out and summarily shot.

But the prompt and notorious abuse of the privilege of discharge by army surgeons and civilian doctors soon reacted in a

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loss of confidence in them by commanders, though the latter were unable to cope in matters requiring professional knowledge of which they were necessarily unacquainted. Medical boards were established in the endeavor to counteract individual bias, credulity or dishonesty, as illustrated by the following order:

GENERAL ORDERS, No. 35.

HEADQUARTERS FOURTEENTH ARMY CORPS, Department of the Cumberland, NASHVILLE, TENN., *December* 11, 1862.

I. Convalescent camps will be established at all the principal posts in this department, under the command of officers of rank and discretion.

* * * * *

VII. The medical director will detail a sufficient number of medical officers for duty at each camp. He will also appoint a board of medical officers to examine cases reported by the attending surgeons, as fit subjects for general hospitals, or for discharge from service.

* * * * * * *

But even the action of boards composed exclusively of medical officers did not prove satisfactory. While they greatly reduced the number of discharges on surgeon's certificate, the number still remained unduly high. As a result, so completely had commanders lost confidence in their medical assistants, line officers were put on these boards, and physicians serving under contract, of whom there were vast numbers with the army, were excluded from sitting thereon, as per the following:

CIRCULAR, No. 5.

WAR DEPARTMENT, Adjutant General's Office, WASHINGTON, *January* 18, 1864.

All invalid soldiers mustered on invalid transfer rolls by surgeons in charge of general hospitals * * * * * will be examined by a board, consisting of a field officer of the Invalid Corps and a medical officer of the regular or volunteer service who shall have power to * * * * * send those judged fit for field duty to their regiments, and to discharge those whose infirmities unfit them for any duty.

E. D. TOWNSEND, *Assistant Adjutant General.*

In their fight upon the evils of absenteeism operating through the Medical Department, the line officers early received the earnest support of the more discerning medical officers of the regular army. The trouble arose through the ideas and acts of the

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volunteer surgeons, who saw no difference between practice under conditions in civil life and in the army. Thus Tripler, Medical Director of the Army of the Potomac, on May 29, 1862, wrote to the Surgeon General:

"So many frauds have been practiced upon the service by malingerers that I have been reluctant to send any more of our sick to the North. We never get any back that have been sent there."

And on the same date this medical officer wrote to the Chief of Staff of the Army of the Potomac:

"I have also to suggest the propriety of taking some measures to have the well men of this army now in the Northern hospitals sent back to their regiments. I feel confident that more than 1,000 men perfectly fit to join their regiments are now idle in the general hospitals. I have given orders to this effect at Yorktown and White House and have no doubt they are obeyed in these hospitals."

The prompt action thus urged by Surgeon Tripler was tardily taken some three months later by General McClellan, as follows:

HEADQUARTERS ARMY OF THE POTOMAC,
September, 28, 1862.

BRIG. GEN. LORENZO THOMAS,
ADJUTANT GENERAL, U. S. ARMY:
GENERAL:

The reduced condition of the old regiments, and the futility of dependence upon the recruiting service for the replenishing of their ranks, points to the necessity of earnest endeavor to collect all the absent officers and men belonging to these organizations.

* * * * *

I suggest that every hospital and staff office be inspected within the month of October, by, if necessary, scores of officers detailed for the purpose to ferret out the old soldiers hidden away therein. Such an inspection would produce more fruit in one week than the recruiting service can in three months.

And, finally, I suggest to the War Department the employment of the deputy provost-marshals throughout the North, more particularly in the arrest of deserters. Convalescent soldiers leave hospitals, and have done so for the past year, and return home habitually. It is the experience of every army commander that not more than a tenth of the soldiers who are left behind sick ever rejoin. A regiment here, which has been employed pretty much during the whole year as depot guard, has had in the course of the year some 500 sick sent to hospitals in the rear. Of these it has received back some 15 or 20.

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* * * * *

I am, general, very respectfully, your obedient servant,

GEO. B. MCCLELLAN,
Major-General, Commanding.

This final recommendation made by General McClellan in his exasperation, that the hospitals be systematically searched to "ferret out the old soldiers hidden away therein," indicates the low estimation to which the executive efficiency of the hospital service had sunk in the eyes of commanders. Such a recommendation was by no means without precedent. Commanders in all armies had long been forced to combat the narrow professional vision by which medical officers could see only the advantage of their patients and remained oblivious to military needs. For example, Wellington, in his Peninsular Campaign, had sent line officers into the hospitals with orders to remove every man who appeared to them able to do duty. As has already been here shown, the Confederate General Bragg detailed an assistant adjutant general for this duty. Of our own time, even, it is reported that General Otis, during the Philippine Insurrection, sent a cavalry officer through the hospitals in Manila on an identical mission. "Needs must" and the tactical situation is always paramount. Such action is most humiliating to the medical service, but the latter is itself alone responsible for the disgrace thus brought upon it. That this method is far from wise is undeniable, for it would seem that other effective ways could be found to force medical officers to properly respect their military obligations. The cavalry officer of General Otis obviously was not such a suitable agent to separate the well from the sick as was the board of medical officers so carefully selected by General Lee. But neither one should have been necessary under a firm, military and business-like medical administration. All trouble of this nature may be largely avoided by assigning sufficient sanitary inspectors of known ability and force of character to walk the wards of the great base and general hospitals, armed with the power to enforce return to duty on the one hand and with that of vetoing sick furloughs and discharges for disability on the other. And there should be suitable disciplining of offending medical officers instituted and prosecuted by the Medical Department itself. Less deference is due to professional courtesy and more in-

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sistence on military obligation to the government and nation. But if a commander has definite knowledge that the privileges afforded by the Medical Department are being abused, and if it actually proves impossible to prevent this through the medical authorities themselves, nothing is left for him but to take matters into his own hands in the way that seems best to him. In case of such action, the Medical Department, instead of being affronted at what at first sight might seem to the narrow minded a presumptuous interference, may better reflect that its duty is military and constructive as well as humanitarian and spend its breath and thought in discussing and formulating measures by which its first of the above obligations may be more efficiently carried out and such humiliating action as its laxity had brought upon itself may become unnecessary. To permit himself to be victimized by the undeserving is no compliment to the humanitarianism of the medical officer but a reflection on and insult to his intelligence and discretion as well as permitting an injury to the faithful soldiers whose dangers and labors are thereby increased and made more arduous by the double tasks which are thus devolved upon them.

REMEDIES FOR SUCH CAUSES OF ABSENTEEISM AS IT IS WITHIN THE POWER OF THE MEDICAL DEPARTMENT TO CONTROL.

The foregoing rather exhaustive consideration of the prevalence and causes of military absenteeism in war, so far as the Medical Department is concerned, naturally suggests the difficulties to be avoided and the measures to be taken in the repression of this tremendous evil. These may be stated in relatively few words.

DISCIPLINE OF TROOPS IN RELATION TO ABSENTEEISM.

This, in its final attributes, rests with commanders. For it, the Medical Department is not responsible. It needs no discussion here other than the calling of attention to the fact that ready access to the sick report by the undeserving very unfavorably affects the general disciplinary state of organizations and commands.

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POLITICAL INFLUENCE IN RELATION TO ABSENTEEISM.

Under our system of government, no person or organization is or can expect to be wholly outside the influence of politics. To this evil the Medical Department is probably in peace less exposed than any other branch of the military service, due to the fact that in the regular service at least, admission of physicians to it, and discharge of medical officers from it, are governed solely by considerations of merit.

But the need for immediate vast increase in all military branches which develops promptly with war, necessarily causes much less careful determination of the qualities of medical officers to receive volunteer commissions under the national government, an evil which the establishment of an inactive list of the Medical Reserve Corps is intended largely to combat. The men on this inactive list are selected for known ability in their chosen lines of work and standing in their communities, have their attention drawn to medico-military matters and needs, and an effort is being made to educate them in the peculiar characters of medico-military service.

The medical officers of the National Guard are likewise largely selected on a merit basis, and by so much are removed from the control of politics.

But if the faulty system of mustering hastily raised State volunteers into the service of the national government is returned to, as would probably be the case in any great war of the future, the appointment of medical and other officers would largely depend upon political considerations and preference, and result in the train of evils already outlined and certain to ensue where the performance of duty is modified by motives of personal policy. The medical profession of the country as a whole, if it fully realized the situation, would undoubtedly set its face sternly against the injection of political considerations into the appointment of such volunteer medical officers; but unfortunately it has not yet been fully awakened to an appreciation of the extent and dangers of the latter. Many medical men have been commissioned in the volunteer medical service in the past, who were unfit, from every aspect, moral as well as professional, to perform its duties or receive its distinction. In the absence of na-

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tional control over licenses for medical practice, the War Department can do little to determine the qualifications of State medical appointees. However, it may and should request Governors of States to co nmission as medical officers no physicians who have not been found by the medical examining boards of their States legally qualified to engage in the practice of medicine. The results of such reasonable requirement would probably exclude many, not only of inferior professional qualifications, but those whose dubious reputations, undesirable habits, and shady political affiliations would tend to weaken their sense of responsibility to the Government. To secure such reasonable requirement, State Medical Societies would undoubtedly give their powerful aid, once the need of such action were brought to their attention. Few governors would dare to stand out against their expressed demand. The results would not be perfect; but that there would be material improvement over what has previously obtained can scarcely be doubted.

ADMISSION TO SICK REPORT IN RELATION TO ABSENTEEISM.

The importance of the function of "sick call," in relation to military efficiency, is not fully recognized. Too many medical officers seem to regard it as one safely and properly to be delegated to a junior, which usually means a medical officer of greater credulity and less experience in the psychology of the soldier. The matter is too often regarded as one concerning the medical department and the soldier only, as being of a purely professional nature, and that of such trivial character as to be safely entrusted to almost anybody. It is too often considered merely as a "sorting out" preliminary to further and more careful attention. This is a half truth, for the first purpose of this function unquestionably is to detect and turn back the undeserving. Too many reflect that if a mistake is made at this time, it may later be detected and rectified. This is, of course, the case in theory, but the difficulties in practice thereof, and the train of evils liable to develop therefrom, have already been brought out in this paper. Following sick call, and before hospital rounds are made, details for the military duties of the day are made; and the chances are that even if the man is later returned to duty as undeserving,

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it will not be until the sick call of the following day, thereby permitting evasion of duty for twenty-four hours in any case. If even only partially successful in this way, the malingerer has succeeded in his purpose of securing absenteeism from duty—temporary if not permanent—and has been encouraged to further trials with a greater experience which, if within limits not great enough to themselves excite suspicion, gives increased prospects of subsequent larger success. The most effective way of checking unnecessary absenteeism is to prevent it at the very outset, namely at sick call.

To do this, company commanders should more fully appreciate the importance of the data, as to "line of duty" or not, which they are required to insert in the sick report before the man reaches the surgeon. This entry by them should be an invariable rule, scarcely to be broken even in emergency. Frequently there is something in the character or habits of the man which will be unknown to the surgeon, and which may be of much importance in deciding as to the suitability of his case.

In addition, there is implied the proper appreciation by the medical officer of sick call in its proper status, as the professional function of the first magnitude with the regiment. Any properly educated medical man fresh from civil life can efficiently treat cases of undoubted physical disability; but the determination of the actual existence of such disability is a phase of medical practice in which, from the nature of things, the average physician in civil life can have had little experience. Such physician in civil life sees men come to him, pay a consultation fee and rather unwillingly accept a status which may interfere with bread winning capacity. Under such conditions there is rarely reason for doubting a history of subjective ailment, even though little or nothing in the way of physical signs may outwardly be apparent. The whole attitude between physician and patient in civil life is one of mutual candor, honesty and trust, and the physician newly commissioned from civil life does not at first realize that under military conditions such relations are completely altered, that no financial consideration interferes with the seeking of his advice by the soldier, that an assured provision at the hands of the Government has removed the necessity for constant effort by the latter toward making a living, and that personal interest in many

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instances is now in position to interfere with that perfect frankness which his civil training had accustomed him to expect from the patient class, irrespective of status. What wonder that he tends to be overcredulous and the easy victim of the designing! He can not be expected to at once change a habit of thought developed by years of professional practice.

It follows as a corollary, that the regimental surgeon on whom devolves direct responsibility for maintenance of the high physical efficiency of his organization, should either take the function of sick call himself or delegate it to a subordinate in whom he has confidence that an exaggerated sense of humanitarianism will not run away with professional judgment and military responsibility. Yet while thus safeguarding the interests of the Government, he must take care that the rights of the individual are fully considered. The task is difficult, medical officers are fallible, medical practice is not an exact science, and mistakes will be made by the best intentioned. It may be that in rarely occasional instances, subsequent events may prove that soldiers denied admittance to sick report were really deserving. Under such conditions, some line officers are too prone to see only the rare instance of individual error, and not realize the vast promotion of the military efficiency of their commands which has been caused by such careful scrutiny of candidates for sick report as in this case has resulted in an unintentional though none the less real injustice. The easiest way for the medical officer is, of course, to accept the soldier's statements at the latter's valuation. If this is done, however, armies will soon cease to exist as fighting forces. Men frequently lose their lives unnecessarily in war through professional error by their line commanders, and if necessary lives will unhesitatingly be sacrificed by the latter for military advantage. Surely occasional professional error rarely costing more than brief discomfort, made by medical officers in their legitimate endeavor to secure military advantage by keeping the ranks full, may be pardoned by the other class whose purpose is wholly inhumane, practical and logically devoid of sentiment! But whether such occasional mistakes by medical officers earnest in their endeavors to promote military efficiency are condoned or not by their confreres of the line, the former should remain steadfast in performing the duty of giving equal justice, in so far as in them lies, to the rights

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of the nation and of the soldier. For as General Upton has so well pointed out, it is a mistaken humanitarianism which unduly favors the individual at the expense of prolongation of war and the thereby consequent vast increase in disability and suffering in the aggregate. Such utter wastage of military strength as thus resulted in the Civil War should never again be permitted to occur.

REGIMENTAL INFIRMARIES IN RELATION TO ABSENTEEISM.

The regimental infirmary is intended under Field Service Regulations, "to care for emergency cases and the slightly sick or injured." Its real function is thus more military than humanitarian —to stop such cases from leaving the regiment as can be held for early duty. As the infirmaries have no beds, severe cases must be transferred to the field hospital. Conversely, the cases retained on the regimental sick report will habitually remain with their company organizations. Though excused from duty, the oversight of these slighter cases by medical officers must as a result of circumstances be occasional rather than continuous. Although usually remaining with the company, they are excused from duty and thereby removed from the jurisdiction of its commanders and placed under that of the regimental surgeon—yet it is apparent that the latter is not at all in the best position to determine, through constant observation, the actual existence and degree of the alleged disability for which admission to sick report was authorized. The arrangement is one which does not conduce to careful diagnosis; and if continued any length of time with individual cases, who are quartered with a company whose duties are not shared, it necessarily introduces a certain element of dissatisfaction therein, and will not meet with the full approval of the company commander. The elements of haste and possible official friction, in addition to that of defective medical oversight, thus become injected into the situation. If the man does not promptly seem able to do duty, the natural tendency on the part of all will undoubtedly be to favor his removal to the field hospital for more complete observation and greater care. To this, a designing patient himself may add by claiming discomfort and distress, through being held under the limited facilities present

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with the regiment. All this, with the other factors previously outlined, will tend to incline the medical authorities toward transfer.

It would seem that this natural tendency to favor separation from the regiment could be successfully counteracted only by the issue of general orders, enjoining due watchfulness against the danger of malingering and requiring that under ordinary conditions all patients should, before transfer to a field hospital, be examined by a medical board composed of all the medical officers on duty with the regiment or separate organizations, and prohibiting such transfer in the case of those in whom the existence of disability could not reasonably be established.

FIELD HOSPITALS IN RELATION TO ABSENTEEISM.

The field hospital is not intended so much as a way station on the route to the rear for all who reach it, as an establishment in which the undeserving patient, who has been successful in evading duty and leaving his regiment, may be halted and prevented from escaping entirely from his command.

To this end, orders, emanating from either the commander or the chief surgeon, should prescribe that each case admitted to the field hospital should be examined and passed upon as to its merits, by a board of not less than two medical officers, within the calendar day of admission; and that except in emergency no case should be transferred from the field hospital to the rear, except as a result of such an examination and recommendation by the medical board, which should be repeated if the patient has remained more than two days in the field hospital.

As a further necessary check, sanitary inspectors should be ordered to pay particular attention to the nature of the cases received by field hospitals, retained therein, or approved for evacuation therefrom to the rear.

Regimental and other medical officers with the fighting troops should be informed as to the measures which are thus taken to verify the accuracy of their professional judgment, and be notified that carelessness in respect thereto, or repeated errors in diagnosis, will be cause for special investigation and appropriate disciplinary measures.

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EVACUATION, BASE AND GENERAL HOSPITALS IN RELATION TO ABSENTEEISM.

The several requirements suggested above for application to field hospitals should likewise be applied to evacuation, base and general hospitals.

In addition, sanitary and other special medical inspectors should tour these great establishments at frequent intervals, carefully scrutinizing the diagnoses entered on the register of sick and wounded and checking up the latter in all doubtful cases by personal examination of the patients concerned.

They must not overlook the fact that in these establishments are liable to be found not only cases which have been malingerers from the outset, but many which, originally suffering from conditions which warranted their admission, have drifted into malingerism as convalescence progressed and return to duty became more imminent. These inspectors will also remember that these institutions in the rear of the fighting force will, from the nature of things, have their medical personnel largely made up of inexperienced, overcredulous and unduly kind medical men, fresh from civil life, whose every sympathy will be largely with not only the welfare but the wishes of the patient and who will be more readily influenced by sentiment, politics and other outside influences which make themselves so felt in these establishments.

An independent medical board of three medical officers, stationed at the advance base, should pass upon all cases referred to it by the medical boards established in the various evacuation and base hospitals, and orders should prohibit transfer further to the rear of any patients not receiving the sanction of this independent medical board, except during periods when its action was temporarily suspended by the Chief Surgeon as a result of battle or other emergency.

Such independent board should have no power to invalid soldiers further to the rear than the next sanitary formation on the line of communications; patients in its opinion requiring removal further to the rear should be merely recommended to the Chief Surgeon, who should take final action in their cases.

Similar medical boards with similar limitations of powers of invaliding, should be established at the various sanitary forma-

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tions along the line of communications. The Russions, with their long line of communications across Manchuria and Siberia, found it necessary, in the checking of an appallingly large and unnecessary absenteeism, to establish five different sanitary zones, the medical boards in each of which had power to evacuate patients only to the next sanitary zone in the rear.

THE LOCATION AND MANAGEMENT OF SANITARY ESTABLISHMENTS IN RELATION TO ABSENTEEISM.

No one can successfully controvert the fact that the location of regimental infirmaries, field hospitals, evacuation hospitals and base hospitals must be exclusively governed by tactical considerations.

But it is not so apparent that these considerations likewise apply to general hospitals, and politics and sentiment will assuredly combine in an endeavor to bring about their location at undesirable points. Such institutions bring a vast amount of money into communities, a fact which business men are not slow to realize. Neither the latter or the railroads are averse to pressing the claims of localities with long, costly hauls, however much these may be to the detriment of the patient and the military service. Friends and relatives desire that the disabled shall be returned to their home communities. Politicians, with their eye to the main chance, will be urgent in pressing demands, the cold blooded selfishness, commercialism and maudlin sentimentalism of which may be concealed under the specious argument of a pseudo-humanitarianism. To these influences the War Department may be expected to yield and scatter its wounded over the face of a continent unless, through being forewarned, it takes a definite and unswerving stand, in this respect, at the very outset of war.

It would be desirable if proper locations for general hospitals could be determined upon in advance of hostilities. Unfortunately, except in a few instances, such can not be the case. Location depends on tactical considerations, and these in turn depend upon the area of active hostilities, which will be largely determined by the foe with whom we may be engaged. With

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England, the theater of war would presumably be our northern frontier and Canada; with Mexico, our southern frontier and that country; with Germany, or other European power of strong land force, the strategic points for the massing of our troops would be in the vicinity of Chesapeake Bay; with Japan, as typifying the Oriental powers, the seat of war might, in part at least, be the Pacific slope; with South American countries, war undoubtedly would be waged on their territory; against a strong sea and land power, Panama would be a bone of contention. These facts, and the further ones that general hospitals must be convenient to the points at which troops are mobilized and engaged, or from which they embark and to which they return, indicate the impossibility of more than tentative selection in advance of points appropriate to general hospital purposes. Only one thing is certain, viz: general hospitals must be located at points strategically most adapted to meet military needs in receiving and returning patients irrespective of other considerations, that they should be near large cities for convenience of communication and supply, and that they should be aggregated as far as possible within limited areas to facilitate their official supervision and the control of their patients. Our past history indicates that these essential qualifications have been so largely disregarded as to warrant grave apprehension lest they may similarly be ignored in the future.

From what has been previously said, it must be apparent that the medical officers appointed to command these vast sanitary establishments must be specially selected with a view to the best performance of the duties of their difficult positions. Few, if any, medical men untrained in military matters—and it must be admitted by no means all regular medical officers—are qualified to perform their arduous and perplexing duties acceptably. The rare combination of high professional ability fortified by rich experience in military purposes and methods, administrative firmness, shrewd judgment tempered with kindliness, a strong yet tactful personality—all these attributes and much more are necessary qualifications of such as are to have these formations under their control.

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HUMANITARIAN RELIEF SOCIETIES IN RELATION TO ABSENTEEISM.

That these societies, operating as they do solely on a basis of good works and sentiment, may readily be perverted by designing individuals into innocent promoters of fraud, has been abundantly demonstrated by their history. With them the military side of matters is naturally unconsidered and the evil results of undue laxity in the administrative control of those alleging disability is habitually overlooked. It is true they co-operate with the sanitary organizations of armed forces, but their purpose differs from the latter in being in no sense military but exclusively humanitarian in the relief of distress. They are therefore particularly liable to promote the evils of unnecessary absenteeism unless held under firm and tactful military control, and they should be made clearly to understand at the very outset that, while the importance of their good offices is fully recognized, military necessity requires that their status with troops be subordinate and wholly subject to military direction and control. Under no circumstances should the agents of these societies be placed under conditions which permit them to have unsupervised control of sick and wounded soldiers, lest their humanitarian ideas and purposes be utilized by the undeserving into instruments for fraud.

To this end, and likewise from tactical considerations, the presence of the agents of such relief societies should never be allowed with fighting troops. Their field of usefulness toward the front should be limited by the advance base, and in many instances it will probably be questionable whether they should be permitted duty that far forward. They may serve excellently at rest stations on the line of communications, for at such points the control of the transient patients is not relinquished by those having them in military charge. Their best field of usefulness is in connection with the base and general hospitals, when they may properly be authorized to equip, maintain and administer the internal management of one or more of the component hospital wards, thereby remaining under the direct supervision and control of the military medical officer in command of the establishment as a whole. But they should never be permitted to operate

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hospitals exclusively their own and be given administrative control over the disabled, on an independent status.

SICK FURLOUGHS IN RELATION TO ABSENTEEISM.

Sick furloughs have probably been in the past one of the most potent factors in the production of unnecessary absenteeism. The whole tendency in our various wars has been to make them so unduly easy to obtain as to cripple the fighting efficiency of armies and prolong campaigns. This must be safeguarded against in the future. To this end the following measures would seem appropriate:

Orders should prohibit the granting of sick furloughs under any circumstances, direct from organizations and commands. No soldier should be kept with the latter until in a condition requiring home care. The proper action with such cases is transfer to some sanitary establishment in the rear, the elaborate facilities of which should at least be given opportunity to effect a cure. Transfer, not temporary escape from military control, is indicated in such cases. And the same applies with equal force to all sanitary formations through which the man may pass en route to and through the hospitals at the base.

No sick furlough should be granted in any case except after the soldier has been admitted to a general hospital, his condition has received the searching study and care which such institutions are intended to afford, and it is further found that convalescence, though probably certain and uneventful, is liable to be protracted. Even in such cases, the issue of sick furlough should be made relatively rare, both in the interest of the government and the man himself. If it is necessary to vacate hospital beds to provide for the reception of more serious and acute cases, the convalescents should habitually be sent to the convalescent camps rather than be furloughed to their homes. The latter procedure may afford a convenient, easy and popular way for the Medical Department to secure a temporary relief from responsibility—but it ultimately creates far greater difficulties in respect to the army at large and opens wide the door to vast military evils which have already been touched upon. If the patient is in sufficiently good condition to go to his home where it is certain that he will re-

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ceive only casual medical attention and that not necessarily of a competent character, it is probably safe to assume that his transfer to a convalescent camp will not interfere with either the rapidity or completeness of his return to health. There may be a few exceptions to this, dependent chiefly upon the mental attitude of individual patients, but as a general rule its desirability can not be questioned. In this manner the convalescent soldier will not get out of military control, and the injection into the case of irresponsible, over-confiding or actually dishonest civilian medical men, with all the complications, delay and opportunity for fraud thereby afforded, will be avoided. Moreover, it is a proper safeguard of the public health to prevent the return to their homes of cases convalescent from infectious disease, who may very likely still harbor the germs of their infection.

No medical officers other than those commanding general hospitals should be permitted to grant sick furloughs, and that for periods not exceeding thirty days. The action of such hospital commanders should, moreover, be safeguarded by explicit prohibition in General Orders, of the granting of such furloughs except in cases where such action has been recommended by the surgeon in direct attendance on the patient, and such recommendation has been favorably endorsed by a permanent medical board consisting of not less than three commissioned medical officers appointed to personally examine into and report upon the special merits of such cases. In this way, the commanders of general hospitals will also be relieved from some of the personal and political pressure which has proved so successful in the past in gaining its end of absenteeism.

It is true that in some cases appeal from an unfavorable action on applications for sick furlough will be made to the War Department. But that does not alter the proper aspect of affairs. If higher authority chooses to grant absence it is no concern of the Medical Department, so long as the latter is not made a cats-paw in the matter.

DISCHARGE FOR DISABILITY IN RELATION TO ABSENTEEISM.

No soldier should be discharged from the military service by reason of disability from any organizations or establishments

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other than general hospitals. Men regarded as unfit to serve with troops at the front must in any case be returned to the rear, and nothing is more logical than that they should be passed back for final and more accurate action in their cases by the reliable medical boards in session at the general hospitals. If these find the soldier disabled, he will be discharged without undue delay or detriment to his physical condition. A full official record will thus be ensured in his case, which will be a reliable guide in determining a pensionable status, fair both to the individual and the Government. If the granting of sick furloughs has been safeguarded in the manner just suggested, it will be necessary to discharge but few soldiers who are not at the time actually in hospital and under military control. No discharge for disability for such cases should be granted except on recommendation of the attending surgeon, fortified by the favorable action of the medical board and approved by the hospital commander.

For the few men given sick furlough and the vastly greater number given ordinary furloughs and subsequently alleging sickness as a permanent reason for non-return to duty—other measures would be necessary. These should include General Orders announcing in advance the policy of withholding all pay and allowances for the period of absenteeism until the legitimacy of the latter could be officially established by the offender. There is no reason why the accounts of the soldier should be closed by discharge—let them remain in suspension in such cases until the matter of absence and need for discharge has been officially investigated. This could be done in many instances by recruiting officers—in some by army surgeons—in others by boards of high class civilian physicians selected by the Surgeon General for their determined reliability and not appointed at the behest of politics. If the absentee could not or would not report in person for examination, he should be visited as soon as possible by such accredited agents of the Government, on whose unbiased recommendation alone should discharge be considered. Under no circumstances should the certificate of unknown persons, whether alleged to be physicians or not, be accepted as conclusive and warranting final action. The cost of such procedure would be utterly trivial in comparison with the results to be secured, both as to the increased military efficiency and vast financial saving in pen-

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sions which would therefore be accomplished. The very knowledge alone of the existence of such machinery for the detection of undeserving absentees and prevention of fraud would do a vast amount toward their prevention. That such a business-like procedure would hold to the colors an immense number of men who otherwise would undeservedly be relieved from their military obligations, and would save to the nation an expenditure for undeserved pensions amounting in the final aggregate to a sum almost inconceivable to human imagination, is undoubted.

GENERAL CONCLUSIONS.

It is apparent that the foregoing practically resolves itself into a plea for a stronger, more business-like administrative management of the Medical Department in time of war.

But to accomplish this to best advantage, common preconceptions as to the full functions of medical officers entertained alike within the army and out of it must be materially altered. It is undeniably true that a feeling of more or less of hostility toward the Medical Department exists in certain military quarters, due not so much through want of confidence in the high professional qualifications of medical officers—for these the requirements of the Medical Department ensure—as in relative lack of that personal sympathy which exists in greater degree between the doctor and patient in civil life. It is not any unsatisfactory results of treatment but especially the impersonal method of procedure along a line of duty which is felt and resented. This attitude is unfortunate, and it is to be especially regretted since it is probably founded on some basis of fact. The mistake is made in judging the army surgeon and the civilian doctor by exactly the same standards. To the officer who is himself sick, it is natural that nothing should be more dearly prized than that close personal relation and interest which is part of the stock-in-trade of the civilian physician and which subordinates all else, however important, even in the uttermost detail, to the promotion of his individual wishes and comfort. But the wider obligation of the medical officer tend to make both thought and action impersonal. His military obligations tend to make him think in numbers larger

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than the single individual therein included, and with a purpose which is not only humanitarian but also one of military economics. This attitude for times of peace of course has many obvious drawbacks, but it must not be overlooked that it is a factor which in time of war tends to hold armies together and very materially assists in preventing their dispersion through well meaning but misdirected humanitarians, thus rendering military achievements possible. How fully to rectify this condition does not seem apparent. Few can cultivate the ideal duplex personality necessary to satisfactorily meet the diverse professional and administrative needs of peace and war for all concerned. Probably many will continue to offset what they regard as an apparently less sympathetic understanding, though none the less efficient professional attitude, by the hope of an appreciation of their greater efficiency in promoting the national purposes for which military forces are levied and maintained. Medical officers are essentially as sympathetic as the great body of their professional confreres in civil life from which they are selected. But it is only to be expected that their duty to the government whose interests they have sworn to protect, and the malingering, fraud and imposition to which they are constantly exposed, and of which even the appalling conditions in part laid bare in this paper can illustrate only in part the extent and degree, should bring about an attitude toward the sick report at once critical and impersonal.

Finally, this study has been prepared in the hope of irrefutably demonstrating the economic need of maintaining and training in peace at least a large part of the no inconsiderable number of medical officers required in time of war to maintain the strength and efficiency of commands; of showing the utter chaos resulting from reliance on civilian physicians to appreciate and perform other than purely professional duty in time of war; and of demonstrating that, in addition to the humanitarian side of the work of the Medical Department, it has other military obligations which form the very foundation of military efficiency, and which in time of war need to be recognized by both line and medical officers in their true—and paramount—importance.

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DISCUSSION.

Major Charles Lynch, Medical Corps, U. S. A., said that he had been much interested in Major Munson's paper. He said further that he thought that the medical department of the Japanese Army in the Russo-Japanese War deserves special study in this connection. "There might be differences of opinion in respect to the performances of that medical department in some of the phases of their work but without any question it reached the highest standard that has yet been attained by any medical department in war so far as it contributed to sustaining the efficiency of the army was concerned. This was manifested not only by the sanitary provisions at every point from front to rear but medical officers were with the line under fire and thus served to preserve the morale of troops. It is true that the medical department, both officers and men, suffered losses. But these losses were suffered willingly and contributed notably to the efficiency of the Japanese arms. Not only were men given prompt assistance on the line but the battlefield was cleared in a manner which was truly marvelous. It was clearly understood that this was the sole duty of the medical department and no rifles were lost to the line by combatants accompanying wounded comrades to the rear. On the contrary, on the Russian side, which lacked the proper medical department organization, losses to the firing line were sometimes so great as to constitute a very serious factor in causing the defeat of the Russian arms. This opinion is supported not only by my own observation but has been frequently alluded to by Russian writers. The necessity of competent military training for the medical department of armies must become more manifest with the more careful the study of war organization. And any nation which does not afford such military training must be seriously handicapped in war as the efficiency of combatant troops will certainly suffer greatly."

Lieut.-Colonel William B. Banister, Medical Corps, U. S. A., stated that he thought if proper care were provided for soldiers in the field it would add much to convince the public that they need not be sent home. He believes that we should determine what we want and then represent our necessities to Congress. "The Surgeon General has plans on file for hospitals in war. We therefore know exactly what we want in this direction and this has been so stated by the Surgeon General. We have an obligation to show the authorities what we need and then if we do not get it the responsibility must be placed on those who refuse to take the necessary action." Colonel Banister spoke briefly of what had happened in the Civil War to reduce the strength of the Army. He believes, however, that unwilling men are best got rid of as soon as possible as they can never be made useful. While he acknowledges that some men will stay at the front if compelled to do so only the combatant spirit will serve to make men fight.

Captain Henry D. Thomason, Medical Corps, U. S. A., stated that he believed that Major Munson's paper offered a potent argument for a

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strong sanitary service in the interests of the efficiency of the Army. "So far we have never had such a service nor has there been the right conception of the duties of the sanitary service by the line of the army. The belief is common that its sole duty is to care for the sick." On one occasion at an Organized Militia camp last year Captain Thomason noted that two officers and ten men accompanied one sick man home.

Major J. F. Edwards, Medical Corps, N. G. Pa., called attention to the importance of sick call as a factor for promoting the efficiency of troops.

Colonel J. K. Weaver, Surgeon General, N. G. Pa., stated that he was himself a soldier in the Civil War and never thought that any soldiers tried to avoid service then. This paper had been a revelation to him. He believes, however, that the proper method of conducting sick call is very important and he cited various instances in different regiments in Pennsylvania when efficiency was promoted and the reverse through the way sick call was conducted.

Major H. A. Arnold, Medical Corps, N. G. Pa., said he desired to speak as a medical officer who holds sick call. Captains always urge that this be shortened and they are often in sympathy with the men. Crowds of men, therefore, come to sick call until the company commanders learn better. There is a great deal to do inside of an hour at sick call. Major Arnold referred to various experiences in Porto Rico, where men in his regiment were taken to military hospitals without his knowledge. He said further that in Juarez, Mexico, there was no medical officer in the Federal hospital.

Colonel A. H. Briggs, Medical Corps, N. G. N. Y., said he was a little on the other side of the fence. He had been fifty years a soldier, serving as an officer since the Civil War. Men were divided into three classes: one, worthless scum; two, pension seekers; and three, worthy men who can be depended upon to do their duty under all circumstances. The first and second classes should be gotten rid of as soon as possible. He had noted that homesickness was a potent factor in inducing men to come to sick call and in his opinion men should be allowed to go home freely while in winter quarters.

Major Munson, in conclusion, said that many men have sordid motives, perhaps not a large proportion but a great many. The pension chaser is encouraged by the medical department. He requested careful study of his paper and invited attention to instances where matters have been taken out of the hands of the medical department. He believes this a very strong argument for a trained medical department. The purpose of his paper is to prevent military waste.

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THE RELATION OF THE ARMY SURGEON TO THE COMMUNITY.*

By SAMUEL LLOYD, M. D., New York City, Medical Reserve Corps. U. S. A.

IN medicine, as in the other sciences, the old ideas are passing. The advances of the last quarter of a century are greater than those of all the past ages. Viewed from the vantage point of one who has lived through this period and been actively engaged in medical work, one realizes that we are on the outskirts only of still greater achievements. The whole scheme of medicine has changed.

Thirty years ago, next month, when I began the study of medicine, we knew nothing practically of tuberculosis; bacteriology was but in its very infancy; the bacillus of tuberculosis (1882) had but just been found; the diphtheria bacillus (1884) was still unknown; the septic bacilli (1881), with all their train of diseases, so long the curse of both army and civil surgeons, had but been hinted at. While Pasteur's experiments and their application to surgery by Lister, although they had been published years before, and adopted throughout the civilized world, yet their true importance was not fully appreciated, and the method of application of these ideas to practical surgery was still exceedingly crude. The typhoid bacillus had just been discovered (1880), and few of the infectious diseases of the intestines had been recognized or even suspected as due to a living organism. Yellow fever, cholera, malaria, and many other diseases were practically uncontrollable and claimed their constant toll of thousands of the human race. Diseases which we now attack and hope soon to master, were unknown as distinct entities, and were usually classified under irregular forms of some well-known condition. Sanitary science, as we know it today, had not been written,—indeed, not even thought of.

*Delivered as an address at the closing exercises of the Army Medical School, Washington, D. C., May 31, 1912.

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Medicine has advanced through all the ages with the progress of its correlated sciences. No one thought of ranking medicine,—even twenty years ago,—with any of the so-called exact sciences, and yet today is it not possible to claim an exactness in medicine, at least equal to that of the chemistry or physics of thirty years ago? When I graduated from Princeton University, there were sixty-odd elements in chemistry; today they claim one hundred and twenty-eight. What they called the atom then, is now known to be a molecule after all. In physics, the practical application of electricity had not been developed; the telephone was still little more than a plaything; electric lights were not in use, and the electric tramway was confined to the experimental flat car to which the recluse of Menlo Park was devoting some attention when he could spare a little time from the telephone and his other inventions. Yet, after the recluse had become the sage or the wizard,—either epithet suits him equally well,—of Llewellyn Park, when all the world are talking to distant lands, when our tired eyes are eased by the brilliance of the electric light, when we are transported even on some of the great trunk lines by electric motors; and whirled through our cities and towns in electric trams; and even if we choose, move about in electric carriages; when we forego the stairs and travel to the upper floors of our homes by means of electric elevators; and use electricity in many domestic occupations, he announces that he intends to take a vacation. When asked in what way he would amuse himself during this period of rest, he exclaimed: "For years I have kept a notebook on my work table in which I have jotted down the unsolved questions that occurred to me in the course of my various experiments, and which I have never had time to look over. I think I will spend my vacation in solving some of these questions." When asked to give some idea of what this book contained, Mr. Edison replied: "The first question is,—what is electricity?" So here, even the greatest exponent of practical physics today is wondering about the origin of electricity. Is it the moving force of all these many planets, as well as the controlling influence in the life and destiny of man? From whence does it come, and where does it go?

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Surely, we men engaged in the scientific study of medicine can claim that certain definite rules are known; that out of the empiricism of the earlier ages there has grown, along with the advancement of our sister sciences, definite knowledge of the progress of disease, exact physiologic knowledge of the functions and relations of most of the human organs, knowledge of the pathologic changes induced by disease, and of the symptomatology of the diseases themselves; knowledge of the limitations, causes, and modes of transmission of the greater number of them; and, still more important, specific modes of treatment and control. If this does not entitle medicine to rank among the sciences, then I do not know what science means.

The biological sciences have grown closer and closer to medicine until today much of the advance in our calling comes from the laboratory. The laboratory worker and the clinician must go hand in hand; physiology has been merged with chemistry, for the older investigations of our earlier great physiologists have been completed, only to discover the wider and equally important field of physiologic chemistry. The study of the internal secretions and their influence upon the animal economy are occupying the time of those who, in the past, devoted themselves to gross physiology.

With the advance in biology has come an awakening in medicine. It is gratifying to find that so much of the work along this line has been done by medical men. John Hunter was one of the earliest investigators in the field. When Darwin published his "Origin of Species" a new impetus was given to investigation, until now, by the study of the cell, the truth has been established. As Osler has said, "In no way has biological science so widened the thoughts of men as in its application to social problems; that throughout the ages, in the gradual evolution of life, one unceasing purpose runs; that progress comes through unceasing competition; through unceasing selection and rejection; in a word, that evolution is the one great law controlling all living things, 'The one divine event to which the whole creation moves.' This conception has been the great gift of biology to the nineteenth century."

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In his work on Social Evolution, Kidd says: "Nothing tends to exhibit more strikingly the extent to which the study of our social phenomena must be based on the biological sciences than the fact that the technical controversy now being waged by biologists as to the transmission or nontransmission to offspring of qualities acquired during the lifetime of the parent is one which, if decided in the latter sense, must produce the most revolutionary effect throughout the whole domain of social and political philosophy. If the old view is correct, and the effects of use and education are transmitted by inheritance, then the Utopian dreams of philosophy in the past are undoubtedly possible of realization. If we tend to inherit in our own persons the result of the education and mental and moral culture of past generations, then we may venture to anticipate a future society which will not deteriorate, but which may continue to make progress, even though the struggle for existence be suspended, the population regulated exactly to the means of subsistence, and the antagonism between the individual and the social organism extinguished. But if the views of the Weismann party are in the main correct, if there can be no progress except by the accumulation of congenital variations above the average, to the exclusion of others below; if, without the constant stress of selection which this involves, the tendency of every higher form of life is actually retrograde, then is the whole human race caught in the toils of that struggle and rivalry of life which has been in progress from the beginning. Then must the rivalry of existence continue, humanized as to conditions, it may be, but immutable and inevitable to the end. Then also, must all the phenomena of human life, individual, political, social, and religious, be considered as aspects of this cosmic process, capable of being studied and understood by science only in their relations thereto."

It is the alertness of medical men to advances in these different sciences that has brought most of our progress in medicine. Jenner was not the first to inoculate for smallpox; the communication of smallpox from one individual to another was practiced so far back that the earlier records are lost. No one knows the beginning of the practice. The Brahmins used pus taken from a smallpox vesicle at least a year before it was inoculated; the

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Chinese understood and employed it, and "ten centuries before Christ the Celestials introduced into the nasal cavities of young children pledgets of cotton saturated with variolus pus." The Arabians and Circassians used needles for the vaccination. In North America, incisions were made between the fingers, and the negroes were inoculated about the nose. Old women in Constantinople, under the Greeks, were instructed in the art. The first account of these practices was published by Timoni in 1714: "The actual introduction of the practice into the West, however, was due to Lady Mary Wortley Montagu, who died in 1762, and who was the wife of the English Ambassador to the Porte in 1717. She had her son inoculated in Constantinople by Maitland, and on her return to London in 1721, her daughter also was inoculated. During the same year experiments were undertaken by Maitland upon criminals, and as these turned out favorably, the Prince of Wales and his sisters were inoculated by Mead. The practice was then more or less speedily adopted on this side of the Atlantic, but suffered occasional severe blows because of unfortunate cases here and there, such as never can be avoided. The clergy, especially, using the scripture as designing men can always do, became warm opponents of the practice, and stigmatized it as an atrocious invasion of the divine prerogative. Nevertheless, in 1746, the Bishop of Worcester recommended it from the pulpit, established houses for inoculation, and thus made it again popular. In Germany it was generally favored, and a little later came into vogue in France and Italy. In 1757, Robert Sutton, near London, professed to have made 15,000 inoculations without a single fatal case. He kept his patients on a strict diet for nine days; then inoculated them with the smallest possible quantity of virus; the operation was not prohibited in England until 1840, although it was much more dangerous than vaccination with cowpox."

The first inoculation with cowpox was done by a farmer named Jesty, in Gloucester, in 1774. This was probably unknown to Jenner, who was told one day, while still a student of John Hunter's, by a milkmaid, of the protection from smallpox enjoyed by those who had become accidentally inoculated with cow-

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pox. When Jenner told Hunter of this fact, the latter said to him: "Do not think. Investigate."

So, the Great Plague of this period was brought under complete control by the casual remark of a milkmaid falling on the ready ear of a medical student. Those who are opposing vaccination today must be ignorant alike of history and of the methods of the preparation of the vaccine.

This, one of the earliest of the biological observations, arrived at by crude experimentation, has proven one of the most beneficent contributions to medical science which we have had. Think of the untold misery and commercial loss it would entail should we have such an outbreak of smallpox today,—with our crowded tenements and rapid methods of communication, not only from town to town, but from state to state and from country to country,—as occurred in London and is so vividly described in Pepys Diary.

If Harvey had been willing "to sit and dream the time away," he would not have discovered the circulation of the blood, nor would Ambroise Paré, the greatest military surgeon of the sixteenth century, have recognized the value of the ligature in controlling haemorrhage, and so one of the great contributions to surgical technique might have been postponed for years.

Pasteur's investigations into the cause of vinous fermentation opened the way for that great thinker and investigator, Lister (1867), to revolutionize the whole practice of surgery, and to start the wonderful advances and the scientific investigations that have made modern surgery a science instead of a simple art. If that keen thinker and clear writer, Beaumont (1825-33), had had the opportunities afforded by the modern laboratories, how much more valuable would have been his studies of the digestion, when he was examining St. Martin's digestive processes through his gastric fistula. Osler says (A Backwoods Physiologist), "To appreciate the value of Beaumont's studies, it is necessary to refer for a few moments to our knowledge of physiology of digestion in the year 1832, the date of the publication of Beaumont's book. In the work of Human Physiology by Dunglison, published the same year, the five or six old theories of stomach digestion,—concoction, putrefaction, tritutation, fermentation, and macera-

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tion,—are all discussed, and William Hunter's pithy remark is quoted: 'Some physiologists will have it that the stomach is a mill; others, that it is a fermenting vat; others again, that it is a stewpan; but in my view of the matter, it is neither a mill, a fermenting vat, nor a stewpan, but a stomach, gentlemen, a stomach.' The results of Beaumont's observations were: first, the accuracy and completeness of description of the gastric juice; second, the confirmation of the observation of Prout that the important acid of the gastric juice was hydrochloric; third, the recognition of the fact that the essential elements of the gastric juice and the mucous were separate secretions; fourth, the establishment by direct observation of the profound influence of mental disturbances on the secretion of the gastric juice and on digestion; fifth, a more accurate and fuller comparative study of the digestion in the stomach, and digestion outside the body, confirming in a most elaborate series of experiments the older observations of Spallanzani and Stevens; sixth, the refutation of many erroneous opinions relating to gastric digestion, and the establishment of a number of minor points of great importance, such as, for instance, the rapid disappearance of water from the stomach through the pylorus, a point brought out by recent experiments,—but insisted upon and amply proved by Beaumont; seventh, the first comprehensive and thorough study of the motions of the stomach, observations on which, indeed, is based the most of our present knowledge; and, lastly, a study of the digestibility of different articles of diet in the stomach, which remains today one of the most important contributions ever made to practical dietetics. The greater rapidity with which solid food is digested; the injurious effects on the stomach of tea and coffee when taken in excess; the pernicious influence of alcoholic drinks on the digestion, are constantly referred to. He proved that dyspepsia is oftener the effect of over eating and over drinking than of any other cause. Beaumont was the pioneer physiologist of this country, the first to make an important and enduring contribution to this science. His work remains a model of patient, persevering investigation, experiment, and research, and the highest praise we can give him is to say that he lived up to and fulfilled the ideal with which he set out, and which he ex-

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pressed when he said: 'Truth, like beauty, is, when unadorned, adorned the most,' and in prosecuting these experiments and inquiries, I believe I have been guided by its light. He proved that 'No life worth naming ever comes to good if always nourished on the selfsame food.' "

Who can estimate the debt the whole world owes to this American Army Surgeon?

Paré with the ligature, and his clear directions about the use of the probe; and Larrey, with his great experience during Napoleon's campaigns, and his rules for the management of the wounded, his establishment of the ambulance, crude though it may have been, and of the field hospital, deserve to be known as two of the great military surgeons of the world. It is due to the latter's work on the battlefield in the transportation of the wounded that we owe the ambulance system of the present day, and the millions of sufferers throughout the civilized world today who have their pain assuaged by the ambulance surgeons and are then transported in comparative comfort to the hospital, the haven of quiet and safety, owe a constant debt of gratitude to Baron Larrey, the greatest military surgeon of the eighteenth century.

Morton, with ether, and Simpson, with chloroform, and Lister, with his antiseptic principles and catgut ligature, did more than all the other surgeons put together to make modern surgery possible. Probably we owe more to Lister than to all the others. Keen describes the preparation for an operation, at the time of our Civil War. "The surgeon approached the operation with the clean hands of a gentleman; he usually wore an old coat covered with the dried blood spots from previous service. His fingernails very likely were long and no special attention was given to them. The instruments were taken out of a velvet-lined case, and were as clean as ordinary table knives would be. The operation was done without any preliminary cleansing of the skin other than to remove any visible dirt. If the knife happened to fall on the floor, it was picked up, rinsed in a basin of ordinary water, and used as it was. The marine sponges then always used, were washed clean in ordinary water, and used over and over again, even after being saturated with foul pus. The blood vessels were tied with ordinary silk; one end was cut short, the

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other one hung out of the wound. After the amputation of a fleshy thigh, I have often seen twenty-five or thirty such ligatures gathered into two bundles, one at each end of the wound. The flaps were then sewed together with an ordinary needle and thread, and the stump dressed first with an old rag or scraped lint spread with simple grease. Over that would be placed some other rags, lint, cotton, or other dressing, and finally, a bandage. During the Civil War these greasy dressings gave place to simple cold water dressings. By the second day the patient would begin to have considerable fever. By the third or fourth the temperature would rise to what we now know (for medical thermometers were not in general use in that early day) to about 103°, 104°, or 105° F. Then we would poultice the wound. Every few hours the patient would be disturbed,—a new poultice put on to replace the old one, now cold, foul, and ill-smelling; and by this time bathed with pus. I have often seen the pus escaping by the tablespoonful, and the wounds alive with squirming maggots, resembling chestnut worms. By this time also it was hoped that the silk ligatures with which the arteries had been tied, had literally rotted loose, and each of them was gently pulled on, to the discomfort of the patient. Care was taken that the ligatures with knots tied on them (in order to distinguish those which secured the large blood vessels) should not be pulled on severely, until probably the tenth or twelfth day. Meantime, the patient was tossing about the bed with pain, with thirst, without appetite, without sleep except such as morphine would secure. This, at the same time, dried up all the secretions, producing constipation and other evils. By about the tenth to the fourteenth day, suppuration having been fully established and quantities of pus pouring from the wound, the fever would subside and the wound begin slowly to heal. Of course the healing could not be complete so long as the silk ligatures were still protruding from the wound. Sometimes they did not become detached for even months or years, but more commonly all of them would rot loose in from ten days to three weeks. When the silk ligatures on the large blood vessels came away, if the healing process had formed in the large blood vessels a firm clot which had become adherent, and, so to speak, corked it up,—all went well. But, as

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very frequently happened, when the ligature and the rotten end of the artery were pulled off and there was not clot to act as a stopper, secondary haemorrhage followed. This often came on after the patient's wound had been dressed, and the surgeon had left, and if so, very likely the first notice that the nurse had that anything was wrong would either be the gasping for breath of the patient, or his moans and cries, or sometimes by the blood which had not only saturated the mattress but had even appeared in a pool on the floor. How fatal were such haemorrhages may be seen from the fact that in 2,235 cases of haemorrhage in the Civil War, 61.7 per cent of the patients died. A large majority of the wounds were followed by erysipelas, lockjaw, pyaemia, septicaemia, or hospital gangrene. The latter at times was so common and caused such ravages that as Keen says, "It became a veritable plague." Today, I doubt if there are any surgeons who have entered practice since 1880 who have even seen a case. This disease has been practically wiped out of existence.

In 2,503 cases of gangrene during the Civil War, 1,142 died. There were 505 cases of tetanus, with 451 deaths; pyaemia claimed 2,818 cases, of which 2,747 died; of 2,382 wounds of the knee joint where amputation was performed, 1,212 of the patients died; while out of 973 similar wounds, where amputation was not performed, 591 succumbed. Compound fractures were exceedingly serious, two out of three dying from some form of infection. Lister's discovery of the animal ligature, thus enabling us to close our wounds completely, added the needed finish to Paré's great discovery. Perhaps it is not right to say "discovery," for the ligature had been employed before Paré, and had fallen into disuse, but he made it popular, and by the force of his example compelled its adoption.

From 1860 until 1880, there was a period of reconstruction. During this period our own Civil War was fought; the great library of the Surgeon General's Office was established, and the Army Medical Museum was founded. The Medical and Surgical History of the War of the Rebellion, that great repository of the medical and surgical history of the times, was compiled and published; the foundations of the great laboratories of the present day were laid,—and preparation made in material and men for

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the development of the science of bacteriology. Then came the wonderful changes that we now know in medicine. Fehleisen, in 1883, discovered the erysipelas germ, now known as one of the forms of general septic poisoning. Nicolaier and Rosenbaum (1887) isolated the tetanus bacillus; and the discovery of countless other germs quickly followed. Following these investigations, naturally came the question of application to the prevention of disease. Medicine began to realize that prevention was more important than cure. Most diseases are now recognized as self limited, so that if the patient's resistance is sufficient and can be kept up long enough, recovery will follow in the natural course of events. With this new conception of disease, treatment changed. Instead of nauseous doses, draining the vitality and overworking the digestive system, the medical man recognized that it was his duty to sustain life, prevent the communication of disease to others, and relieve suffering, leaving the rest to nature. So sanitary science and preventive medicine came to the front. In this work the Army Surgeon has taken a foremost place. Preventive medicine or sanitary science has been the means of arresting the ravages of diseases that in former times devastated nations and laid continents low. The medical man is the sanitary engineer of the present day. When the teachings of these men are appreciated by the public at large, and when they are provided with proper measures to carry out their rules, many of the diseases which still remain will be wiped out, or, if they occur at all, will be recorded as medical curiosities.

A short review of two or three of these conquests will give an idea of what has already been accomplished. The Plague, now known as the Bubonic Plague,—in India, within a few years, 250,000 deaths resulted from this disease alone. This was nothing compared with its former toll of life. In 1665, 75,000 people died of this disease in London, and the descriptions of this epidemic in Pepys' Diary and in James's novel, "The Fire and the Plague," give a vivid picture of the devastation it caused. During the century just passed, it was confined almost entirely to Oriental lands, where sanitary laws are not enforced and the communities have not been educated to protect themselves from the infection. With the discovery of the bacillus by Haffkine, and the deter-

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mination of the fact that it was carried by rodents, and by the demonstration that it is possible to prevent its spread by proper vaccination, and by the destruction of rats, squirrels and other rodents, it will probably disappear from these lands.

Cholera first appeared in Europe in 1832. In France, 120,000 people died; in New York City there were 3,500 deaths; in 1892, in the city of Hamburg, there were 18,000 victims (Keen, Debt of the Public to the Medical Profession), with 7,614 deaths. Altona, like Hamburg, drank the water of the Elbe, but after it had received all the contamination of the latter city. Altona had a filtration plant; Hamburg had none, and Altona had only 516 cases,—most of them refugees from Hamburg.

Smallpox. I have already spoken of the part played by Jenner in controlling this disease, and I should not mention it again in this address were it not for the fact that within a few weeks, in one of the Boroughs of the City of New York, two or three cases of smallpox were discovered. But when the Board of Health applied to the Alderman for an appropriation of $10,000, in order to properly vaccinate this district of the city, it was refused on the ground that they, the Aldermen, did not believe in vaccination. Dinsdale has stated that before vaccination, 2,000,000 persons died of smallpox in a single year in Russia. In 1707, in Iceland, out of a population of 50,000, 18,000 died. In Mexico, in the sixteenth century, 3,500,000 persons died, and in some places there were not enough left living to bury the dead. Bernouilli estimated that there were 60,000,000 victims of this disease in the eighteenth century. Macaulay said "the havoc of the plague had been more rapid, but the plague visited our shores only once or twice within living memory. But the smallpox was always present, filling the churchyards with corpses, leaving on those whose life it spared the hideous traces of its power, turning the babe into a changeling at which the mother shuddered, and making the eyes and cheeks of the betrothed maiden objects of horror to her lover." In the Franco-German War in 1870, the German Army had compulsory vaccination; the French did not. In the former there were but 261 cases, while the latter had 23,469. Do the opponents of vaccination realize their responsibilities? Not only the commercial loss to the community if an

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epidemic should break out and a quarantine should be maintained against them, but the inestimable agony of those bereft of those they loved and depended upon for support?

Diphtheria. When I was first in practice, one of my most fruitful sources of income was from tracheotomy, and later, intubation for diphtheria, and then came antitoxin. It is safe to say that I have not had to perform a trachoetomy once, nor an intubation more than two or three times since,—and that, in spite of a practice that is at least ten times larger than in those early days.

These are enough to show the value of the laboratory and the advances made in the period between 1860 and 1890. In this period your own Surgeon General (Sternberg) contributed not a little to the advance. More important still have been the results of the investigations conducted by your own corps during and since the War with Spain. You all know the prevalence of typhoid fever among the troops during the Spanish War. Major Walter Reed was appointed as the head of a Board to study the cause and spread of the disease. Here, again, a great advance in our knowledge of this dread disease was recorded; the common fly,—that pest of every household and of the whole community, formerly looked upon simply as a nuisance, has been proven to be a dangerous criminal. In the Spanish War there were 20,738 cases of this disease, with 1,580 deaths, in an army of 107,973 men,—one in five. Eighty-five per cent of the deaths in this war alone were credited to this disease. In the Boer War (Russell, Boston Med. & Surg. Jour., Jan. 5, 1911), the British had 31,000 cases with 5,877 deaths, and in the Franco-Prussian War of 1870, there were 73,396 cases, and 8,736 deaths,—sixty per cent of the total mortality.

Compare these statistics with those of the manoeuver division in Texas during the year just past. Here every precaution was taken to prevent the propagation of flies, and to deprive them of access to any infectious material. "The sanitary police," says Kean (The Sanitary Record of the Manouever Division, Jour. Am. Med. Assn., August 26, 1911, p. 713), "was rigidly supervised by the medical officers, so that this crowded camp site which had been used continuously for four months, when vacated,

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presented nothing offensive to sight or smell." "The immense advance in camp sanitation, and particularly the value of the protective measures, can be estimated by comparing the typhoid incidence of this camp with that of the Second Division, 7th Army Corps, which was organized at Jacksonville, Fla., about June 1, 1898, and remained there in camp until October, some of the regiments leaving in September. This division was not conspicuously unfortunate in its typhoid record for that time, and is selected because of the close similarity of its conditions of service to those of the Manoeuver Division. The two divisions were encamped in nearly the same latitude and for about the same length of time, and each had a good camp site, and an artesian water supply of unimpeachable purity. While the period in camp of the second division was later in the year, the number of men involved was larger for the Manoeuver Division. In the men encamped at Jacksonville, there were 2,693 cases of typhoid fever, and 248 deaths, out of a mean strength of 10,759; while in the Manoeuver Division, out of a mean strength of 12,801, when compulsory typhoid vaccination was first employed, there was one case of the fever in a hospital corps man who had not yet completed his immunization, and no deaths. In Jacksonville there were 281 deaths from all diseases; in the Manoeuver Division, there were 11." All honor to the medical corps that could show such a record, and that could demonstrate the value and the practicability of the present measures against typhoid.

There can be no question of the authenticity of these records. There is no selfish end to be attained by any juggling. They stand as a clear evidence of the value of scientific medicine in the face of this dread scourge of the human race, and they must compel,—indeed, I am free to say, they are already compelling,—the adoption of the preventive inoculation for typhoid among the people at large. This whole question of typhoid prophylaxis has been proven to be practical and efficient by our army medical men. As Russell says: "the high degree of efficiency shown by the medical service in the recent mobilization is not fortuitous, but is the fruit of patient, laborious, and ably directed efforts to apply the lessons of the Spanish War and to assure the best results. This efficiency is a legitimate source of pride and satisfaction to

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the medical profession of the country, and should be a sufficient demonstration to the government of the wisdom of adequate and generous provision for its sanitary service. It is regrettable to read of shortages of officers, of men, and of mules, for the sanitary organization when only a single division is mobilized."

There need be no dread of the results of vaccination, for the Surgeon General in his last report states that during the calendar year of 1910, 16,093 persons were inoculated, and in the first six months of 1911, 27,720 were immunized. As a result of the reports of all the cases treated, he says that "in no case has there been any untoward results, not even an abscess at the site of the inoculation." For a full record of this work, I would suggest that you read the publications of Major Russell.

Ronald Ross, an army surgeon in India, demonstrated that the malarial parasite was communicated from bird to bird by the mosquito, and this observation was soon confirmed by a number of observers to be true in the human race. As a result, we now know how malaria can be prevented. First, any individual with malaria is dangerous to the community and should invariably be thoroughly treated with quinine; second, marshy districts and ponds in which the mosquitoes breed, must be carefully drained; and, third, those living in infected districts must be carefully protected by the proper screening of their houses from the bite of the infected mosquitoes. The extermination of this disease is only a question of money,—which must be provided by the authorities,—and the application of proper sanitary measures.

An epoch-making investigation was that conducted by Major Walter Reed into the cause of yellow fever in Cuba in 1900. Associated with him in this work were Acting Assistant Surgeons James Carroll, Jesse W. Lazear,—a martyr to his zeal,—and A. Agramonté. It was fortunate that at this time the Military Governor of Cuba was our present senior Major General, Leonard Wood, a trained medical man, as well as an accomplished soldier. It was due to his appreciation of the importance of the subject, and his hearty co-operation, that Reed was able to arrive at results that have been of so much value to localities affected and to commerce in general.

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Reed felt convinced that yellow fever was carried by an insect. He was led to this conclusion by the investigations of Ross and others with malaria, his own experience with the fly in typhoid, and by the suggestions of Finlay, of Havana, who some years before had suggested that the mosquito was the cause of yellow fever, but who had not succeeded in proving it. Reed instituted the most careful series of experiments ever carried out, to prove the cause of the disease; discovered it without the peradventure of a doubt, and labelled the carrier for all time. As General Wood has said of him: "I know of no other man on this side of the world who has done so much for humanity as Dr. Reed. His discovery results in the saving of more lives annually than were lost in the Cuban War, and saves the commercial interests of the world a greater financial loss each year than the cost of the Cuban War. He came to Cuba at a time when one-third of the officers of my staff died of yellow fever, and we were discouraged at the failure of our efforts to control the disease. In the months when the disease was ordinarily worse the disease was checked and driven from Havana. That was the first time in nearly two hundred years that the city had been rid of it. The value of his discovery cannot be appreciated by persons who are not familiar with the conditions of tropical countries. Hereafter it will never be possible for yellow fever to gain such headway that quarantine will exist from the mouth of the Potomac to the mouth of the Rio Grande. Future generations will appreciate fully the value of Dr. Reed's services. His was the originating, directing, and controlling mind in this work, and the others were assistants only." He had "The reason firm, the temperate will, endurance, foresight, strength and skill."

The investigations that we have already detailed made the Panama Canal possible. The French failed because sanitary science was not available to stop the constant slaughter of the canal laborers. Walter Reed and his co-workers in preventive medicine have done more to make the canal a certainty than all the engineers who have directed the actual construction.

Colonel Gorgas summarized these statistics up to 1909, the latest that I have been able to find (Jour. Am. Med. Ass'n, Aug. 29, 1909), as follows: "Taking the total force, the French aver-

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age during their nine years, was 10,121; they had in Ancon Hospital 5,651 deaths. The French were building the canal at Panama just as the subway in New York City was built, so far as police control was concerned. If a laborer got sick and went to his home and died, they had no means of finding out what became of him; the man was simply dropped from the rolls. If he died in the hospital, he was recorded as a death, but not otherwise. After giving the matter careful consideration, I think it fair to say that two men died out of hospital for every one who died in hospital. Estimating on this basis, and knowing that 5,651 died in hospital, we would have a total loss of 16,593,—that is, the loss was eight-fifths of the average force.

"The average American force for the past five years has been 26,532. Eight-fifths of this would be 42,449, which would be the number of deaths for nine years. For five years, this would give us 23,580. I therefore make this claim for the sanitary work done on the Isthmus: That had not this work been done, we would have had the same losses as occurred under the French régime. At the end of the fifth year of work, this loss from yellow fever alone would have been, according to the French Hospital figures, 3,463 Americans; according to my estimate, 8,087. The actual loss has been 19. At the end of five years, from all causes, and in the whole force, the loss would,—according to my estimate, have been 23,850; our actual loss has been 3,317."

I have not time this afternoon to call your attention to the wonderful work being done in the Philippines, and to the work of Ashford in Porto Rico, of Craig, Russell, and many others in the Medical Corps who are doing new and original work. Even as I was preparing this address a commission was starting for South Carolina, under the auspices of the Post-graduate Medical School and Hospital, commanded by Captain Joseph F. Siler, of your corps, for the purpose of studying pellagra. The money for this expedition was furnished by Col. Robert M. Thompson, of New York, and Mr. J. F. McFarland, of Philadelphia, and is the first instance, so far as I know, of the application of private funds to the study of infectious disease and the possibility of their control.

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The Conservation Commission has reported that three million people of this country may be considered on the sick list, and that their annual loss in wages is $700,000,000. It is stated that three-fourths of this illness is preventable. Tuberculosis costs the country every year $1,000,000,000. Calculate, if you can, the value in dollars and cents to the world of each advance in medical knowledge.

Gentlemen of the Graduating Class: I have traced cursorily, it is true, enough of the work done by the Army Surgeon to show his value to the community at large. The contributions of the men in your corps to medical science have been of inestimable value. Who knows, but sitting in these seats today, there may be a future Paré, a Larrey, a Lister, or a Reed!

Many medical observers in time past have viewed the advances made in medicine during their lives, and, like Alexander, have wept aloud that there were no more worlds to conquer, little recking of the undiscovered countries lying beyond their immediate horizon.

In his address at his inauguration as President of Princeton University a few days ago, President Hibben said: "If there is an especially favored class in the world, it is the group of men who have profited by the privileges of an education. It is their duty to prove themselves worthy of recognition as an aristocracy, —as an aristocracy, however, in the original meaning of that word,—and their rule and influence in the community in which they live will show itself to be the best, so far as it is determined by a wise purpose to devote the power of knowledge to the betterment of human conditions, and to the satisfaction of human needs." "Make a man, and he will find his work." You are picked men, and yours is a wonderful opportunity. You are standing in the dawn of the most glorious day in medicine. You have been trained for the work as few men have been trained before. You will have the impetus and the association of those, your seniors in rank, who are working out the problems of the future, and doing it well. The opportunities are yours. The facilities are provided for you. Your duties call you into various fields; you move from one locality to another; from the comforts

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and distractions of metropolitan life to the isolation of the tropics; in each field new problems await solution. I believe you will prove worthy of the task.

Remember that wherever you may be:

"Thou hast left behind
Powers that will work for thee; air, earth, and skies;
There's not a breathing of the common wind
That will forget thee; thou hast great allies;
Thy friends are exultations, agonies,
And love, and man's unconquerable mind."

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MEMOIR OF ALEXANDER HENRY HOFF.*

ALEXANDER HENRY HOFF, Bvt. Col., U. S. Volunteers, Captain, Medical Corps, U. S. A., in whose memory the memorial medal was founded, was born in Philadelphia, Pa., December 18th, 1822.

The family of which he was scion settled in Somerset County, New Jersey, during the early Colonial period. His father was the Rev. Brogan Hoff, a graduate of Rutgers College, and a minister of the Dutch Reformed Church; his mother, Caroline Clay, of an old Delaware family.

Alexander passed his childhood and youth in his native city, received his education there and took his degree in medicine at the Jefferson Medical School with the class of 1843; Professor J. K. Mitchell, the father of Dr. Weir Mitchell, being his preceptor.

Upon graduation in medicine, Dr. Hoff was appointed interne in Blockley Hospital and later became house physician. During this period he acted as demonstrator of anatomy at Jefferson. Even then he had a decided leaning towards things military and passed his examination for appointment in the Medical Corps of the Army, but his father so vigorously opposed his entering the service that he declined the appointment.

Dr. Hoff settled in New York State and soon established an extensive practice, but his interest in military matters continued. He was for a number of years examining surgeon of recruits at Albany, and in 1854-56 was Surgeon General of the State. He married a daughter of the late General John S. Van Rensselaer.

Deeply imbued with the principles of the Republican party, a lover of his profession and with his military tendencies, it is not to be wondered at that he was among the very first to offer his professional services to the country in 1861. He was assigned

*The following memoir of his father was read by Colonel John Van R. Hoff, U. S. A. (retired), at the graduating exercises of the Army Medical School, May 31st, 1912.

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as Surgeon of the 3rd N. Y. Vols. and soon had his baptism by fire at the affair at Big Bethel, where a lantern was shot from his hand.

In August, 1861, Dr. Hoff was commissioned Brigade Surgeon of Volunteers, and during that war filled many positions of trust and responsibility. He was the director of the fleet of floating hospitals on the Mississippi river and the originator of the modern hospital ship.

So incessantly was he occupied that he had little time to record his extensive professional experience, but such records as are available bear witness to the fact that he was abreast of the best professional thought of that day.

Reporting on the sick received aboard the hospital steamer D. A. January in October, 1862, he said: "Most of them are suffering with diseases of the intestinal tract; however, in the last two loads there has been more intermittent and remittent fever, complicated with flux. Whether this is a necessary complication, caused by the influences of climate, or depends upon mistreatment, is a matter of much importance. The history of the cases, so far as they can be obtained, points strongly to the treatment as a considerable factor." Surgeon Hoff held that the excessive use of mercurial preparations under field service conditions, resulting in the salivation of 50 per cent of the cases, was unjustifiable, particularly as no apparent good followed in cases which, with their discontinuance, often yielded to proper diet alone. Speaking of prophylaxis of malaria he reported: "I cannot say that I am in favor of the whiskey ration even as a vehicle for the administration of sulphate of cinchona." His report on the misuse of mecurials was largely instrumental in having these remedies stricken from the field supply table.

Dr. Hoff's predilection was towards surgery, but his views were conservative. For example, he contended that the then accepted practice that gun shot fracture of the humerus with wound of the brachial artery imperatively demanded amputation, was not justified and warmly advocated attempts to save the limb.

Regarding primary amputation at the hip joint for gun shot injury he thus expressed himself: "Out of more than a hundred thousand sick and wounded soldiers transferred under my direc-

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tion while connected with the hospital transportation department, no case of the kind came under my observation, and of the seventeen thousand transported on the hospital steamer D. A. January, under my immediate supervision, I saw no such case. * * *. The day after the battle of Shiloh I had occasion to make several amputations at the upper third of the thigh, just below the trochanter. These cases were all transferred to the general hospitals at St. Louis and were apparently doing well four days after the operation, but, I think they all ultimately died.

I received very few patients on board the hospital transports who had undergone amputation very high up in the thigh, and among the large number of applicants for artificial limbs who came under my observation while stationed in New York City upper third stumps were great rarities. I am inclined to think that not more than ten in a hundred, if as many, survive amputation in the upper third." Based upon his observation and experience, Dr. Hoff believed that the results of primary amputations lower down did not encourage us to expect much from amputation at the hip joint, a far more formidable operation.

His conclusions were justified by the statistics of the Civil War; but how different the story today. I saw six cases in which amputation had been done at the hip joint, in a single Russian hospital, during the war in Manchuria, all of whom were well on towards recovery.

The history of the hospital boats on the Mississippi river forms a very interesting chapter in Surgeon Hoff's military record, which is set forth all too briefly in the Medical and Surgical History of the Civil War.

In the beginning there were no boats at the disposition of the Medical Department. In order to clear the front of even a single sick or wounded soldier, it was necessary to apply to the Quartermaster of the Army. This official, naturally, gave preference to his immediate duties and the demands of his own department in the way of transportation; so, even when a boat was secured and partly filled with sick and wounded, it was frequently delayed until the demands of other departments were complied with. The necessities of the ill and injured, at that period of the war, says its medical historian, were apparently of secondary

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consideration, and the medical officer who exerted himself in their behalf, alike in the interests of humanity as well as military efficiency, was regarded as seeking a personal favor. Surgeon Hoff was the active factor in resolving this situation. His cry for more means of transportation for the sick and its control by the Medical Department was finally heeded.

In 1864 the subject of this memoir was transferred to New York City as Medical Director of Transportation, where he had charge of the receipt and distribution of the sick transferred from field and other hospitals east of the Alleghanies. Utilizing the experience gained in the West, he planned and supervised the arrangement of the ocean steamer J. K. Barnes, the first ship built in this country for hospital purposes, solely.

Nor were his duties here devoid of personal danger, for the attitude of some of the "people" at that period was not kindly towards soldiers, even though sick or wounded.

During the unloading of a hospital boat at one of the city wharves the sick were set upon by the rabble. Surgeon Hoff, who was supervising the debarkation, went to the rescue and got into the midst of a desperate fight, which left him with a broken leg.

March 1st, 1866, he was honorably mustered out of the Volunteer army and given the brevet of Colonel for faithful and meritorious service.

His taste for military life, which had manifested itself in the beginning of his professional career and became fixed by his experience during the Civil War, led him to renounce the brilliant prospect that civil practice offered and he determined to remain in the Army. After an examination which placed him fourth in the very large class of that date, he was commissioned Assistant Surgeon, U. S. Army, with rank of Captain, May 14th, 1867.

He accompanied the first troops sent to Sitka after the purchase of Alaska from Russia, was assigned as Medical Director and served there two years, then two years in San Francisco Harbor, and in 1872 was assigned to duty at Governor's Island, N. Y. In 1874 he was detailed as recorder of the Medical Examining Board and remained on this duty until he died, August 19th, 1876.

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He was modest to self effacement, faithful to his duties as physician and soldier, seeking only the reward of service to humanity embodied in the commendation, "Well done, good and faithful servant." May Colonel Hoff's example be to you all an emulation, stimulating you to higher effort and greater result in the service of your country and humanity.

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OBSERVATIONS OF A REGIMENTAL SURGEON WITH THE MANEUVER DIVISION.*

By Major GEORGE M. EKWURZEL, Medical Corps, U. S. Army.

ON SANITARY ADMINISTRATION.

THIS was ideal for the attainment of the results for which our department has been particularly striving. Decentralization was the keynote. Each regimental surgeon was expected to produce results and was given the power to do so. This was accomplished by a provision in General Orders No. 2, Maneuver Division, to the effect that every regimental or other commander would immediately carry out the sanitary recommendations of his senior medical officer, or, if he deemed them impracticable or beyond his authority, would forward the recommendations with his comments to the next higher commander. This was the best possible deterrent to ill considered suggestions by medical officers and at the same time absolutely ensured action upon wise recommendations. It should unquestionably be embodied in field service regulations in order to prevent the misunderstandings, inefficiency and disease that have been so frequent in the past as a result of pigeonholing or delaying action upon sanitary recommendations. When in addition to the above, the division commander authorizes the sanitary inspector to issue orders in his name upon purely sanitary matters, as perfect results in sanitation as may be possible under given circumstances are secured without paralyzing individual effort and invention, as is bound to be the case when a complete, iron-clad set of sanitary orders is issued from headquarters.

ON TRANSPORTATION.

One of the greatest handicaps under which the regimental surgeons labored was the difficulty in securing the transportation prescribed by the Field Service Regulations. The officers of the

*Read by title at the 20th Annual Meeting.

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regiment to which the writer was attached were exceptionally broad-minded and particularly well disposed toward the Medical Department, yet it was with the utmost difficulty that it was possible to procure the escort wagon provided by regulations and division orders, and a fair proportion of mounts. A pack mule never was assigned. The view of the regimental commander and his quartermaster appeared to be that it was *most* important to provide the attached sanitary troops with transportation facilities—provided, always, that any remained after the regiment was fully supplied. It was quite impossible to reach an agreement to the effect that the regiment and the sanitary troops should each have their proportion of the mounts which *were* available.

It is evident that friction and inefficiency will continue to prevail until the medical department owns and controls its own transportation and is constantly practised in its use. This is impracticable at present for the very excellent reason that we have not enough Hospital Corps men for the routine work in garrison or for the litter and aid work in the field and, therefore, have no one to care for the mounts, draft and pack animals, saddles, harness, pack saddles and wagons. *We need these men* for work in war and for training in time of peace. The full field allowance of Hospital Corps men and medical officers should be stationed with all mobile troops in garrison, and the transportation should be constantly used in drills, practice marches, etc.

Ambulances, with their teams and harness, should be medical property. The opinion has been advanced and with good reason that they should rather be regarded as mobile hospital wards than as transportation in the ordinary sense. It will be observed that the ambulance is the only link in the aid chain that is in the hands of the Quartermaster Department. The Hospital Corps should have the grades of wagoner, farrier, saddler and blacksmith as do other mounted organizations. Corps men are constantly being shifted from mounted to dismounted service and, it seems to me, should always have the clothing and equipment of mounted men. It is unfair, for example, to expect our men to buy both a slicker and a poncho, as many of them have to do.

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ON PAPER WORK.

On duty with the Maneuver Division in Texas there were approximately 700 Hospital Corps men. Perhaps 200 of them arrived with the troops of the line. Their personal equipment was invoiced from posts to infirmaries, necessitating possibly twenty sets of property papers. On arrival at San Antonio most of these men were sent to the various divisional units, about one hundred and fifty sets of papers being required. Then men were sent from almost every post in the country and assigned upon arrival to Field Hospitals, Ambulance Companies and regimental detachments. Frequently a number of men were sent from a post with their property all on one set of papers and upon arrival were assigned to a number of organizations. In such cases the papers were returned to be made out separately for each man. Had the division been on the march this would have been utterly impracticable. It probably meant two hundred and fifty sets of papers altogether. Upon the breaking up of the division each surgeon invoiced the personal equipment of his men to the surgeons at the various posts from which they originally came, necessitating about three hundred more sets of papers. The following is probably a conservative estimate of the number of sets of property papers that were prepared for personal equipment on account of the formation and dispersal of the division:

From posts to infirmaries	20
From infirmaries to divisional units	100
From posts (for casuals)	250
Upon breaking up of division	300
Other transfers	30
Total	700

By one set of papers is meant:

Invoices and receipts, medical	4
Invoices and receipts, ordnance	4
Invoices and receipts, quartermaster	4
Letter of advice to invoicing quartermaster	1
Credit slip from quartermaster	1
Additional memorandum receipt	1
Total	15

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15x700=10,500, the number of separate documents made out WITH THE ULTIMATE RESULT OF BRINGING EACH ARTICLE BACK TO THE SAME PLACE FROM WHICH IT STARTED, IT HAVING BEEN IN THE POSSESSION OF THE SAME MAN ALL THE TIME. These figures take no account of the work involved in checking property returns in the War Department. Is this common sense? Would any business firm do it? This clerical work was absolutely unnecessary, would have materially tended to paralyze the work of our department had we tried to carry it out in actual war, would, in fact, never have been carried out by either regulars or volunteers and should be eliminated in theory as it most certainly will be in fact.

It is believed that the following plan would be simple, practical, economical and easily carried out and would give as accurate an accounting as at present. Let each medical officer in command of Hospital Corps men or receiving them by enlistment or by transfer from the line of the army issue to each man his equipment, taking his receipts as vouchers to his medical and ordnance returns and sending the receipt for quartermaster property to the quartermaster. Let it be understood that "Pvt. John Doe" or "Sgt. Richard Roe" means "Pvt. John Doe, *equipped*" or "Sgt. Richard Roe, *equipped*." If he be transferred a dozen times no invoices and receipts will be required. Upon his death, discharge or desertion his property will be taken up by the officer under whom he is serving at the time. Upon the promotion of a private to noncommissioned rank the Surgeon General may be notified of the resulting change in equipment by information slip. When equipment is lost or becomes unserviceable it can be dealt with as at present, being replaced from the property in store which would be carried on returns as now. It is believed that less reserve equipment will be required than at present because we now have to have on hand a full set for each man of our authorized strength whether we have the men or not. For the information of the property bureaus in the War Department returns would contain the notation "—— noncommissioned officers and —— privates and privates first class belong to detachment this date." There is no reason why quartermaster equipment should not be

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handled in the same manner as medical and ordnance, the surgeon notifying the quartermaster when property is to be taken up or dropped. It would be far less clumsy and cumbersome than the method now in vogue.

Another useless multiplication of clerical work is the preparation of so many descriptive lists. It is probable that 1,600 transfers were made, and the same number of original and office file descriptive lists made out—3,200 in all. Much of this could have been avoided had there been no prohibitions regarding forwarding D-L's by endorsement or pasting in of slips. The work of transferring corps men would have been very much simplified if we could have endorsed D-L to the medical officer receiving the man and inserted in our own file of dead D-L's a slip after this fashion:

Smith, John L., Pvt. 1st Cl., equipped.
Transferred from Fort Myer, Va., per par. No. 12, S. O. No. 45, W. D., 1911, Joined Aug. 11. D-L recd. Aug 15, 1911.
Paid by Maj. X to include Aug. 31, 1911. Deduction, 1 H. C. knife from pouch, sixty-two cents ($0.62).
Transferred to Amb. Co. No. 1, per par. No. 4, S. O. No. 8, Maneuver Division. Left Sept. 8.
D-L. forwarded by endorsement Sept. 8.

Capt. M. C.

TYPHOID PREVENTION.

Calculating from figures published by Col. Kean, Medical Corps, it is found that if the division of troops assembled at Jacksonville, Florida, in 1898 had been as strong numerically (12,659) as the Texas division it would at the same rate have had 2,034 cases of typhoid. We had one. The two separate brigades had none. To my mind it is evident that if our methods: injection of anti-typhoid vaccine and either destructions of,

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or occlusion of feces and urine were applied to the civilian population typhoid would soon be as rare and comparatively mild as smallpox has become.

ON FIELD WORK.

This was invaluable. Personally the writer feels that he learned more about the duties of a military medical man than in all his previous service, and that the study of map reading, topography, equitation and a certain amount of ballistics, combined with infinite practice in the art of keeping in touch with the firing line while maintaining communication with the line of evacuation of wounded is a part of our work that if neglected will lead to confusion, inefficiency and disaster.

In every maneuver the impossibility of affording, without the complete prescribed personnel, the aid that will be expected of us in time of war was demonstrated conclusively—and this when the regiments were but little over half strength. At least one Hospital Corps man should be on the firing line with each company and one medical officer with a sergeant should accompany each battalion, particularly when the battalions are operating independently. This would have used up my entire personnel of three medical officers, three sergeants (one first class) and twelve privates and privates first class, leaving no one at all for the important duty of establishing and manning the aid station; and crippling the functions of the medical officers for lack of orderlies. Actually it was necessary to rob the firing line in order even to simulate an aid station, and this in actual warfare would have meant the neglect of a most important function—affording first aid and moral support to the men in the heat of action. Although the work was fascinating it was almost purely theoretical, for we had to "simulate" half the personnel, the regimental aid station, the wounded and even the pack mule.

One would think that a nation of ninety millions would be able to put into the field enough medical officers and Hospital Corps to equip a single division, but this task was evidently beyond the ability of the United States under existing conditions. About seven-eighths of the requisite number of hospital corps were present. The divisional units were almost complete and the regi-

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mental detachments were just half strength. The following from an official telegram of March 28, 1911, shows how the posts were stripped:

"Telegraph immediately number noncommissioned officers and privates, Hospital Corps, your post, that can be spared for duty with Maneuver Division, San Antonio. In making report number of men left on duty at post should be reduced ***notwithstanding inefficiency that will result thereby.*** If necessary, detail enlisted men of line to replace Hospital Corps in duty not requiring hospital training. Above based on telegram from War Department this morning. Immediate action is desired.

Italics, of course, are mine. While the medical department of the army is now, as I am firmly convinced, in better condition to take the field than ever before in its history, one blushes to think of the miserable deficiencies of personnel and transportation and of the misdirected energy devoted to useless clerical work that would have detracted so largely from our efficiency in care of sick and wounded had we crossed the border into Mexico. Immense improvement in these directions has been accomplished in the last few years and the year 1911 is a banner year in that respect. But much yet remains to be done. We need more men, both enlisted and commissioned, we need a better class of enlisted men, we need more practical equipment, we need our own transportation, we need to have the *power* of our department in matters of sanitation independent of the personal equation of the commanding officer and we need business-like methods in paper work. Prospects for the future were never brighter than at present, and it is to be hoped that our much needed improvements may be instituted before we are surprised by our next big war. When it comes it most assuredly *will* come as a surprise, and if we are to meet the crisis with credit to ourselves and our corps we must be ready all the time.

NOTE.—This article was written shortly after the writer's return from San Antonio. Since that time it has become evident that the clumsy system of descriptive lists is to be changed for the better. A serious step backwards, however, has been taken in depriving of their mounts those detachments which were fortunate enough to have them. It is to be hoped that this arrangement is but temporary.

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APPENDIX.

HOW A REGIMENT SHOULD TAKE CARE OF ITSELF IN THE FIELD TO AVOID DISEASE.

For Each Soldier.

1. Wash your hands before going to meals and after urinating or going to stool.

2. For drinking or washing the teeth use *only* water that has been boiled or has been pronounced safe by a medical officer. Do not trust your own opinion.

3. Use only your own cup, canteen, mess kit, and towel and never let anyone else use them.

4. Do not eat food which has been exposed to flies.

5. When in or near camp do not urinate or defecate except in the regular rears. Whenever you defecate cover your deposit and *toilet paper* completely with earth.

6. Avoid all contact with men who are even slightly sick.

7. It is your duty, whenever you see anyone breaking the above simple rules, to stop him or report him. He is a danger to every person in the camp, *including you.*

Rears.

8. For a one night camp—trenches 10 inches wide, 2 feet deep and 5 feet long. If a pole seat is used they should be twice as wide.

9. For a longer stay they should be deeper and should be burned out and limed daily.

10. The moment the regiment arrives at the camp site an emergency rear should be dug.

11. All rears should be filled up on leaving. One rear should be left open until the wagons are leaving, when it also should be filled in.

Kitchens.

12. Serve food hot. *Do not keep any food where flies can get at it.* Wash your hands before handling the food.

13. Incinerator pits should be dug 2 feet wide, 4 feet 6 inches long, 6 inches deep at one end and 12 inches at the other. Line

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with 6 or 8 inch rock if obtainable, carry the rock lining one tier above the ground level and bank it. Have rocks well heated before using the incinerator.

Police.

14. Remove and burn all bits of food material, manure, etc., that may attract flies or become maggoty.

* * * * * *

If the above rules are carried out they will absolutely prevent diseases that have killed many times as many soldiers as the enemy has in every war the United States has ever had.

In addition, the following suggestions will be useful:

Bathe daily if possible.

Wash underclothing as frequently as you can.

Wear woolen socks.

If your feet are sore, swollen, or unusually red, soak them in cold water for half an hour, and get some foot powder from the infirmary.

Be temperate in eating and drinking.

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GUNSHOT WOUNDS IN MILITARY SURGERY.*

By Major FREDERICK M. HARTSOCK, Medical Corps, U. S. Army.

Foreword.

THE recent commissioning of a large number of physicians and surgeons throughout the country in the Medical Reserve Corps of the U. S. Army has been necessary to accord with the plans of the War Department in order to have an efficient force which could be utilized as an accessory to the regular and volunteer organizations in time of war. Experience in the past has demonstrated that a practitioner taking up medico-military duties, however skilled he may be in his own line of work, finds himself seriously handicapped because of lack of knowledge of two very essential subjects, namely—

Military Hygiene, and the Management of Gunshot Wounds.

The purpose of this paper is to touch on the latter subject in such a manner that the essentials may be easily understood; and to this purpose the subject is considered in tabloid form, for ready and quick assimilation.

In taking up the subject of the modern high-power rifle, for the sake of brevity the U. S. service arm is used as an illustration—the various other small arms of the foreign powers differing so little in essentials that the wounds produced are practically the same in character.

The theories of the modern rifle advanced before 1898 have been displaced by the facts produced from the Spanish-American, Boer, and Russo-Japanese Wars. The modern arm which I shall attempt to describe is the U. S. magazine rifle, a weapon essentially of American construction and design, and embodying the best points of all arms extant.

The projectile is of the modern type, conoidal-cylindrical in shape and composed of two parts, a hardened lead core and a cupro-nickel steel jacket. The bullet is of .30 calibre, and weighs

*A lecture by request of the Wayne County Medical Society of Detroit, Mich., and published by permission of the Surgeon General, U. S. A.

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150 grains, and is propelled by a charge of 50 grains of nitroglycerine powder.

On leaving the rifle it attains a muzzle velocity of 2,800 feet per second, which decreases to 1,130 feet at a distance of 1,000 yards. At the muzzle of the rifle it will penetrate ¼ inch of steel plate and at 500 yards 32 inches of pine wood. The decrease in velocity explains the difference in effect on tissue at short and long range.

The rifle is sighted to 3,000 yards, but carries a distance of 5,465 yards at extreme elevation. The trajectory of the bullet is such that with the enemy firing standing there would be a point-blank danger space of 718 yards. In battle the extreme range of the rifle is rarely used, so that of most wounds inflicted the type would correspond to those received at a distance of 1,200 yards or less.

I quote from Straub the following which demonstrates the probable battle ranges:

"Fire upon a body of troops at close order of the width of 15 yards will generally be effective, up to . . . 1,200 yards . . . or upon a section of artillery up to . . . 1,500 yards, and upon troops in column . . . from 1,500 to 2,000 yards."

A few brief generalities about battle casualties and the relative proportion of wounds are here inserted to enable the reader to have some relative idea of the actual work to be expected in battle.

It is now assumed that casualties will be in the proportion of one killed to four wounded—the following table of recent operations shows:

Battles.	Killed.	Wounded.	Proportion.
Cuba and Philippines—1898	269	1,682	1 to 6.25
Philippines—1899	333	1,759	1 to 5.28
Philippines—1900	305	782	1 to 2.56
Boer War, S. A., up to Sept. 15, 1900	2,998	14,074	1 to 4.69
Russo-Japanese War: Japanese—1st Army, Japanese—2d Army, Japanese—3d Army,	34,222	121,556	1 to about 3.2

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The relative proportion of wounds from the different arms may be taken as a general guide:

Second Army at Battle of Mukden, Russo-Japanese War—

Rifle Wounds	85.83
Shell Wounds	17.73
Bayonet Wounds	0.45

Of these there were involved—

Head and neck	16.08%
Trunk	30.31%
Arms	25.16%
Legs	28.26%

GENERAL EFFECT OF THE SMALL CALIBRE BULLET AS RELATED TO ITS DYNAMICS.

In considering the effect of the new projectile, it must be borne in mind that in the past few years a change has been made by many of the great powers in the bullet, both as to weight and shape. As about 100 grains have been taken off the former Mauser and U. S. service types of projectile and the ogival point modified to that of a sharp tip with the bulk of weight at the extreme base, there some difference is to be expected in the wound effects at various ranges.

Due to the extreme twist in the rifling, the bullet maintains a gyroscopic steadiness up to the battle range over 1,200 yards with a flat trajectory of 700 yards. After the extreme range, a slight wobbling occurs, and it is thus apparent that keyholing or marked deflection will take place and a consequent jagged wound with extreme exit laceration. Because of the greater weight at the base, recent experiments have demonstrated that the following effects may be noted.

Explosive effects are common up to 500 yards and are noted in soft tissues as well as bone. Bony tissue is ordinarily comminuted especially on the distal side of the injury—this applies as well to compact bone as to cancellous.

Lacerations of viscera are more severe.

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Because of easy deflection, the bullet will not follow the line of entrance but will often lodge in distant parts.

In general, it may be said that wounds of greater severity may be expected from the recent modifications.

With the modern bullet, we encounter one special point not formerly considered in connection with that of the low-powered arms—I refer to its explosive effect. The projectile has a terrific impact and imparts its acquired energy to the tissues adjacent in a certain ratio to its velocity and distance. It may be said that the tissues fail to adjust themselves quickly enough to prevent the quick radiation of the bullet's energy, so that for a great distance from the point of impact the tissues are displaced with almost as great ratio of violence as in the wound itself. To illustrate this, I cite the experiment of La Garde in which a shot was fired at a short range into a 60-gallon barrel of water, with the result that two of the iron hoops were burst and the staves throughout shattered.

It has been popularly thought that the extreme velocity of the bullet would produce sufficient heat to render it sterile, but such is not the case, as experiments have shown that the bullet, even at short range, rarely acquires a temperature of over 95°,—thus wounds from the new bullet cannot be said to be sterile. Indeed, in connection with the fact that a bullet at long range is unsteady and easily deflected, we will find many cases infected from bits of clothing carried into the wounds.

THE GENERAL TYPE OF WOUND AND ITS IMMEDIATE COMPLICATIONS.

An undeflected bullet at battle range invariably produces a very small wound of entrance not larger than the end of a lead pencil and with the edges slightly raised, and with, frequently, an area of ecchymosis around the entrance.

A perforating effect is noted on soft tissue and spongy bone at mid-ranges.

The explosive effect is noted at ranges under 700 yards, and great laceration over 1,200 yards.

The wound of exit varies considerably because of the tissue encountered—at short range the laceration of soft parts is quite

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severe, for example, in the thigh or arm an exit wound of 3 inches diameter is common, the intervening tissue presenting a cone-shaped, pulpified mass. On hard bone at any range extreme comminution is the rule, particles of bone being driven sometimes to a considerable distance from the wounded part.

Hemorrhage as a complication may be said to be immediately fatal or slight—the larger vessels are more sharply severed, permitting free bleeding, but possibly due to vaso-motor contraction the smaller vessels give little trouble.

General shock is often not great in proportion to the trauma—though more severe in thoracic and abdominal perforations. Local shock is severe, and local function is lost in area about nerves, blood vessels and extremities, even for days.

Ordinarily, just after injury, pain is not an immediate complication in a severe form, probably because of the local shock and injury to sensory nerves, but extreme pain will be encountered later upon reaction.

RICOCHET, LODGED AND DEFLECTED MISSILES.

Ordinarily the surgeon thinks of injuries from the modern arm as clean-cut and perforating. Such, however, is not the case; a goodly proportion of lacerated wounds are encountered due to deformed bullets from ricochet and long-range shots in which the bullet has lost its balance and keyholes.

These cases are frequently infected from earth and clothing, and laceration is severe; the entrance wound being very large and lodgment of the projectile or pieces of its jacket, frequent.

Wounds of Special Parts and Their Management.

INJURIES OF THE CRANIAL CAVITY.

For clinical purposes, gunshot wounds of the cranial cavity group themselves into—

General Injuries,

Guttered and Ricochet Wounds,

Basal Fractures.

Nearly all wounds involving perforation and laceration of the brain are immediately serious.

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Statistics give about one-third fatalities in wounds of this type, but these figures are faulty to a degree, as the dead are not considered and the mortality of cases reaching medical aid thus lowers the general death rate.

It is probable that 75% of brain injuries prove fatal, either immediately or within 24 hours.

The cases experiencing the explosive effect of the bullet under battle range made up largely this group.

The less severe injuries present the following indications:

Control of Hemorrhage,

Relief of Bony Pressure,

Repair of Tissues.

The projectile itself, though readily localized by the X-ray, should rarely be sought for.

Extensive operative proceedings should not be undertaken, and the work should be done with the minimum sacrifice of bony tissue. Hernia cerebri is most common after these cases and extremely troublesome to handle.

In the Russo-Japanese War, the Russian surgeons erred in this regard, and a large proportion of hernias was the result. In the event of no pressure symptoms, a small trephine opening or gentle manipulation of depressed bone with light anesthesia and quick work will save many cases.

A patient with a gunshot injury of the calvarium is no subject for extensive surgical manipulations.

Guttered and ricochet wounds must be carefully considered; fractures of the internal table with extensive splintering and laceration of the meningeal arteries are not infrequent. These cases should invariably be inspected—particularly should the patient show any localizing symptoms or lapse into a state of unconsciousness.

In some cases, it will be difficult to distinguish between pressure due to hemorrhage and "radiation," concussion of a sector of the cerebrum from the transmuted energy of the bullet.

Fractures of the base are mentioned separately because of the difference from similar hernia in civil life—general extensive fissuring, hemorrhage from the ear and nose being absent. Further; in fractures of the base, the injury may be complicated with

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a wound entrance of the face or mouth, and the additional chance of infection is added. In general, bear in mind that early treatment of brain injuries is indicated. Small trephine openings, rapid exploration and closed wounds, with no after-manipulation, give the best results.

WOUNDS OF THE THORAX.

Under this head it is necessary to dwell chiefly upon wounds of the lung; gunshot wounds of the heart or great vessels prove almost immediately fatal, and otherwise are treated on general surgical principles.

Pulmonary wounds include quite a large proportion of those demanding careful treatment, and furnish the best proportionate results from proper care. Shock and hemorrhage are the prominent symptoms. The former is immediate and does not persist as long as with wounds of other viscera.

Hemorrhage is present in about 90% of the cases in sufficiently great quantity to be considered as a hemo-thorax. Except in a small proportion of cases, the lung does not furnish the bleeding—intercostal and pleural bleeding is responsible.

Pneumonia is not a common sequela, though evidence of lung laceration is manifest by the presence of râles around the wounded area and the reaction fever which reaches 102° or so for a few days. Pneumo-thorax is rare, and will not be considered.

The blood in the pleural cavity may undergo several changes; most frequently if evacuated at the end of a week it is still liquid and of a port wine color and consistency. Clotting, however, does take place, sometimes very early, and late aspiration will show in these cases a fibrin deposit at the dependent area, with a fluid serum on top. Absorption may be effectively accomplished with no after effect except adhesion. Empyema is rare in untouched cases; Makins in his South African experience never saw it in an untouched injury. I should say the correct line of treatment in lung cases lies in what not to do—rather than in extensive surgical interferences. Nearly all hemorrhagic effusions into the pleura will clear up in time. Unwarranted interference by operative measures will surely result

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in an empyema, in cases treated as they are under war conditions. Evacuation by the Potain aspirator may be necessary where pressure symptoms are great, but incision is absolutely contra-indicated. In the general treatment of the cases, absolute rest is essential, any slight transportation conduces to intrathoracic bleeding. The wounds of entrance should be sealed, the chest strapped, opium freely administered, and the patient left to nature.

WOUNDS OF THE ABDOMEN.

It is this class of cases that furnish us with the greatest mortality.

Up to the present time under war conditions, abdominal injuries have been a *noli me tangere* to the surgeon. The figures of three wars from 1898 up to the present have varied little. Because of the invariable evil results from operations under battle conditions, consequent to delay and to lack of favorable surroundings, the military surgeon has been led to treat perforating injuries in this region largely expectantly. In civil practice with a patient in a fine modern operating room and under the six-hour interval, a skilled operator may get a large percentage of recoveries. In a patient who has withstood hours of fighting, loss of sleep, transportation several miles after injury; and who has reached the hands of the operator after a period of six hours, operation is hazardous even in its immediate results.

Thirty-three and one-third per cent of abdominal perforations die within 24 hours, and after three days the mortality rate will have increased to 75%.

It is probable that almost all patients with multiple perforations of the intestinal canal succumb. Single perforations of the stomach and colon have a chance of recovery. Injuries of the small intestine furnish the highest death rate. Injuries to the mesenteric vessels prove fatal in a short time, the modern bullet severs the blood tracts sharply, with but little tearing, and violent hemorrhage occurs.

On the solid viscera of the abdominal cavity, the amount of trauma depends upon the range of the bullet. Up to 700 yards,

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the liver, spleen and kidneys are pulpified; with the lowered velocity at longer ranges, the local destruction is limited and recovery may take place in the absence of infection.

Liver wounds are apt to be accompanied by great shock as well as hemorrhage, and uncomplicated perforations are rare; these cases reach the surgeon too late for operative assistance.

Simple perforations of the bladder are serious, and unless seen early, urinary extravasation has already taken place, although a considerable proportion of the injuries recover spontaneously, and peritonitis is not as constant a complication as would seem likely.

Immediate shock in abdominal injuries does not always follow; instances are related of patients who have walked 1,000 yards to a dressing station and seemed in good shape; yet all cases with visceral perforation exhibit shock within the hour. It is a strange fact that local shock manifested by intestinal paresis is frequent in perforations of the abdomen without injury to the viscera.

The management of these abdominal cases presents a problem to the military surgeon. After a battle the field hospitals are crowded with patients demanding immediate attention; a lengthy abdominal exploration, possibly resulting in extensive resections of the intestines, takes time even under the best conditions. With the great chances of infection present and the slight hope of ultimate relief, the surgeons of all armies have about agreed that the greatest good to the greatest number is obtained by not handling these injuries beyond the immediate antiseptic means demanded.

Where fair facilities exist, however, and rubber gloves are obtainable, a compromise should be made on those cases obviously of a hopeful character. Simple perforations of the stomach can be sutured. Perforations of the colon with fecal extravasation may be so simple in character as to give good chances of recovery. Injuries of a transverse or antero-posterior type in the small intestine area generally exhibit multiple perforations as well as injury to the mesentery, and are poor risks. Wounds involving the liver proving not immediately fatal have a good chance, and should not be touched.

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Kidney wounds heal kindly, and frequently with no other symptoms than hematuria. Splenic wounds are likely to be fatal, without operation, and excision will be necessary. Bladder injuries require immediate peroneal section, or at least continuous drainage by catheter.

As the modern missile does not displace tissue as did the old slow power slug, it would be expected that partial destruction of the coats of blood vessels would be noted—and such is the case. Lynch reports a very large number of false aneurisms observed in Manchuria. He states that of 1,000 cases, operated at the great Japanese hospital at Hiroshima, there were 102 aneurisms of the traumatic variety. Very good results have followed simple ligation and evacuation of the clot, and it is apparent that these cases would offer great opportunity for the various plastic procedures recently devised.

Bone injuries on the battlefield are exceedingly difficult cases to handle, particularly where the injury involves the lower extremities. As these fractures are always open, and generally extremely comminuted, with the adjacent structures severely lacerated, the part is likely to become greatly swollen, even to the extent of interfering with its circulation, and acute traumatic gangrene is not infrequent. Especially in cold weather with local shock and limited circulation, it is obvious that amputation will frequently be necessary. Again, transportation increases the chances of infection, as it is impossible to completely immobilize these cases, particularly injuries involving the femur.

Von Lagenbeck is responsible for the statement that gunshot wounds of the femur would be better treated on the spot where the soldier has fallen rather than risk the danger of transportation.

It may be put axiomatically that these gunshot wounds of the bone should be dressed and immobilized at once, and not probed or irrigated until a later day when the greater chances of infection have passed.

As spongy bone is frequently drilled cleanly through, joint injuries give very little trouble—infection is infrequent and the local trauma is not great enough to permanently destroy function.

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These cases are generally returned to duty in from two to three weeks, with very little impairment of movement.

In conclusion, it may be said that wounds from the modern arm, involving other than muscular structures, are likely to be severe in character and very liable to infection; and good results depend on immediate aseptic closure of the involved area combined with rest.

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SIMPLE METHODS OF DIFFERENTIATING DISEASE-BEARING INSECTS.*

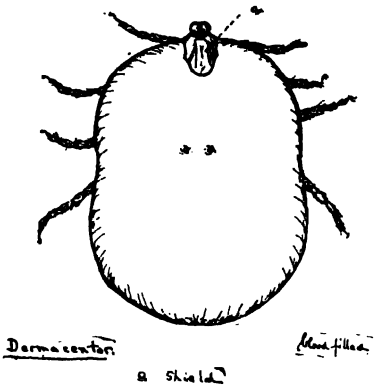
By C. S. LUDLOW, Washington, D. C.

IT is the purpose of this paper to present some points of difference in insects of interest from the medical standpoint, and through them to offer some short cuts to their determination. The considerations which I shall present are elementary, and in the *Diptera* are recognized by Entomologists as of great value in differentiating groups, my special reason for selecting them being the ease with which they are recognized.

Among the *Arthropoda* which are to be considered in this paper are one Order of the Class *Arachnidae* and four Orders of the Class *Hexapoda* (true insects) of which the *Diptera* give by far the greatest number of forms connected with the transmission of disease.

The *Diptera* will be considered as a group, but the other four forms will be compared in twos, in reference to their general resemblance, and with no regard for their entomological relationships.

CLASS. *Arachnidae*.



Easily differentiated from the *Hexapoda* in having four pairs of legs.

ORDER *Acarina* (Ticks).

Under this order are three genera, proved, or supposed, to be connected with the transmission of Relapsing Fever and Yaws.

Brown, oval or roundish ani-

*Read before the American Society of Tropical Medicine, June 3, 1913.

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male, in which the thoracic parts and abdomen are fused to make one sack-like, easily distendable body.

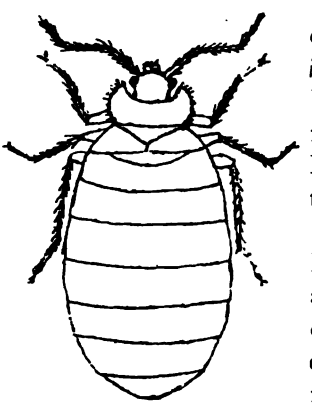
There are two groups; those having a shield covering part, in the female, or, in the male, nearly the whole of the body; and those without this shield. Unfortunately, this difference is of no help to medical workers, for *Dermacentor venustus* and *Dermacentor modestus,* the carriers of Rocky Mountain Fever, have the shield, while *Ornithodorus moubata,* connected with African Relapsing Fever, and "the bordered *Argas,*" an undetermined species suspected of carrying Yaws, are without the shield.

The sack-like body is distinctive of the tick in comparing it with the form most easily mistaken for it, the bed-bug, for the latter has head, thoracic parts, and abdomen, and the abdomen is distinctly segmented, the segments perhaps more clearly seen on the ventral aspect.

CLASS. *Hexapoda.*

ORDER *Hemiptera.*

GENUS. *Cimex* (Bed-bugs).



Cimex lectularius

after Marlatt.

Two species are of interest as disease-bearers, *Cimex-lectularius,* distributed throughout the North Temperate Zone, the carrier of European Relapsing Fever, and *Cimex rotundatus,* a tropical or sub-tropical form, found in Porto Rico, Sierra Leone, and St. Vincent, as well as in India, Malay, Aden, etc., connected with the transmission of Kala-azar and probably Leprosy.

The most readily seen differences between these two species are (a) the greater length of the abdomen in *lectularius, rotunda-*

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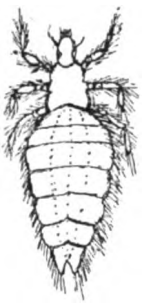
tus being much the rounder, (b) the cephalad margin of the thoracic parts, that of *lectularius* being more markedly in-cut, so that the head is more enclosed by it, and (c) the angular shape of the last abdominal segment of *rotundatus*.

The next forms to be considered are lice and fleas.

Both are small, grey, swift-moving, wingless insects, the former compressed dorso-ventrally, and the latter compressed laterally.

ORDER *Hemiptera.*

GENUS. *Pediculus* (Lice).



Pediculus capitis
(after Howard)

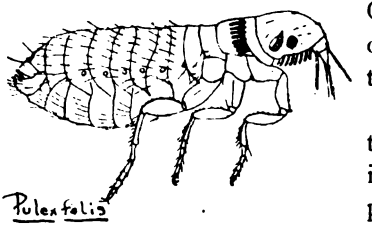
The differentiation of species is possibly most easily made, so far as those species usually found on mankind are concerned, by the locality on the host. *Pediculus capitis* has lately been proven connected with Typhus.

P. vestimenti is said to be one means of transmitting Relapsing Fever, and possibly Leprosy.

Comparing the fleas with the *Pediculi* we find the lateral compression and method of movement of the former distinctive.

ORDER. *Siphonaptera* (Fleas).

All fleas were formerly included in *Pulex*, but are now divided into several families and genera. Of these only a few are known or suspected of being transmitters of Plague.



Pulex felis
(after Banks)

Colonel Giles published, sometime since, a table for the placing of these insects, which will probably answer our general purpose.

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1. Obvious eyes.
   a. Both inferior border of head and hind border of prothorax serrated.
      Eight serrations* to lower border of head; prothorax with eight serrations on either side; tarsal claws of moderate size, but stout.
      Pulex felis.
   b. Lower border of head unarmed, but prothorax serrated. Prothoracic collar with ten serrations on either side; tarsal claws small and delicate; profile of head curves down much more sharply to the vertical than in preceding or following species.
      Ceratophyllus fasciatus.
   c. Neither inferior border of head nor the prothorav serrated.
      Tarsal claws short and delicate, antipygideal bristles short.
      Loemopsylla cheopis.
      Tarsal claws long and scythe-like, antipygideal bristles short.
      Pulex irritans.
2. "Blind species."
   a. Inferior border of head and the prothorax alike serrated.
      Inferior border of head with 4, and posterior border of prothorax with 11, serrations; tarsal claws small and delicate.
      Ctenopsylla musculi.

This table is, of course, intended to cover only those species likely to be connected with disease. Another table equally valuable will be found in "The Rat and Its Relation to the Public Health."

The *Diptera,* which, so far as is known, is the most important order in the transmission of disease come next, and here is found a means of differentiation so interesting, and easily recognized, and so much more simple than the methods usually used, that it has seemed worth while to present it for your consideration. It is the wing venation.

*The word "serrations" does not well describe the ctenidia which are spike-like bodies, standing free from the edge.

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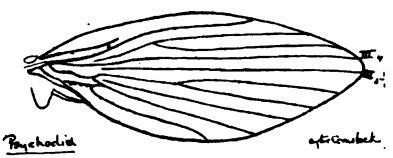
Professor J. H. Comstock, of Cornell University, was the first to show the evolution of the wing and that the development from the simple wing venation to the more complex venation ran parallel with the changes in antennae, palpi, ocelli, etc., on which the differentiation and classification of the various families of flies had been made. As a basis from which to work, Professor Comstock takes a rationally supposable wing of an immature form, in which all the veins and all their branches are present, and through the coalescence and change of direction of some of them, shows how the intricate specialized forms arose.

The wing venation becomes, therefore, to a certain point, a means of classification; it is distinctive of the group to which the fly belongs; it always indicates the family, so there need never be any question as to whether a given specimen belongs to the *Psychodids,* the *Simulids,* the *Culicids,* the *Tabanids,* or the *Muscids,* and in some cases it even shows definitely the genus to which the species belongs.

The advantage this method has is that it gives differences easily and clearly seen and understood, and requiring so little effort of memory that it makes the recognition of at least the group available to every one.

ORDER *Diptera* (Flies).

The *Psychodidae* (moth-winged flies) have wings of a very simple type.



The veins are very straight, two are forked, but in spite of that the effect is of straight lines; vein III_4 and III_5 have not coalesced as in the mosquito wing, and both veins begin at the base of the wing. The veins are covered with hair-like scales which give the wing the "moth-like" appearance.

GENUS. *Phlebotomus.*

The wing is a little longer, relatively, than in the *Psychodid* wing figured, but the venation is practically the same.

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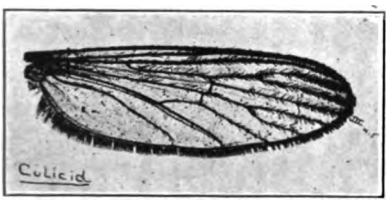
P. Papatasii carries "papataci fever," and it is possible that later experiments will prove it connected with other diseases. It is a very small insect, easily escaping notice, and where it is to be excluded, in studies in the transmission of disease, great care, some ingenuity, and nets of extremely small mesh will be required, as it passes easily through the usual mosquito net. It will be most easily confused with the *Corethrinae,* because the *Culicid* wing venation is somewhat similar, and the long hair-like wing scales are common to both *Corethrinae* and *Psychodidae.*

FAMILY. *Culicidae* (Mosquitos).

A family that probably gives us more known hosts than any other of the *Hexapoda.*

The wing venation suggests that of the *Psychoda;* but is a little more intricate, and except in the sub-family *Corethrinae* the veins are covered with flattened scales.



The fork cells are nearer the apex of the wing, and the veins III_4 and III_5 have coalesced to form what is usually called the "third longitudinal vein," which does not begin at the root of the wing. These are characteristic changes, and the apical half of the wing is distinctive of the *Culicidae.*

There are several sub-families, of which only two, the *Anophelae* and the *Culicinae* have any definite value in connection with disease. These sub-families may easily be confused unless the differentiation of sex be clearly made, which usually is readily done by differences in the antennae; those of the male are plumose, bushy, or "wooly," while those of the female are "thread-like." Curiously enough these differences seem much more readily observed by the untrained worker in an illustration than in the insect itself, so that one who easily recognizes these points in a photograph or drawing often fails to distinguish the male from the female when studying the insects.

Before entering further into this subject it is necessary to say

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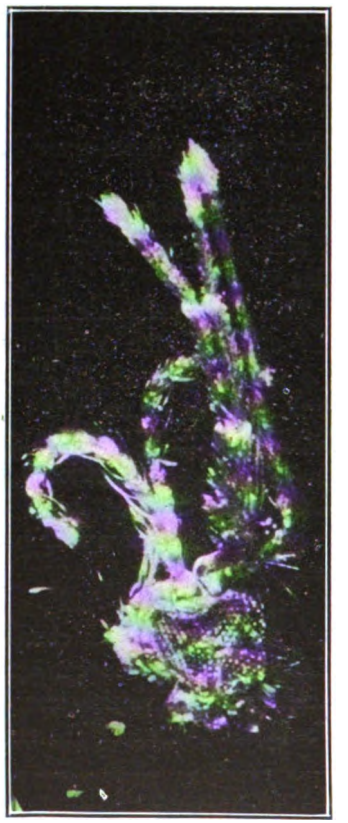
that the systematic work in this family is in great confusion, and there are many conflicting opinions as to the basis for classification. I use Theobald's classification, if for no better reason because it is only the one, hitherto, that covers and puts into any kind of system the mosquitos of the tropics as well as those of the temperate zone. The *Anophelines* include all the species known to be hosts for the malarial parasite.



The females are separated from all others by their long palpi, which are about as long as the proboscis. Here the value of the sex determination is worth attention, for if the antennae are neglected it is quite easy to mistake a female *Anopheline* for a male having unplumed palpi, an error which may cause some chagrin.

The disease-bearing *Anophelines* are easily grouped by the wing markings and sometimes this characteristic is also specific. *Myzomyia funesta* Giles is practically recognized in this way. *Nyssorhynchus fuliginosus* Giles can always be distinguished by its wing.

The group *Myzomyia Rosii*, *M. Ludlowii*, and *M. indefinita* on the contrary have wings so alike that other points must be taken to separate them. Possibly this is the cause for some confusion which surrounds *Ludlowii*. Whether this species breeds in salt water or not it surely breeds in fresh water, for the specimens on which the species was founded were taken in a mountainous country, where brackish water is not found. There is possibly a fourth species to be reckoned with.

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The wings of the *sinensis* group are also not safe for differentiation of species and other points must usually be added.

In America the wing markings will for the most part be indicative but *maculipennis* may be confused with a western *Culicine,* and *franciscanus,* which it seems likely is carrying malaria in the very western south, is easily confused with *punctipennis,* its most easily seen difference being its spotted wing-fringe. In Cuba and the Canal Zone the wings of the two disease-bearing forms are fairly distinct, and the leg markings are characteristic in each case.

The *Culicinae* give only three forms of especial interest.

Stegomyia calopus, easily recognized by its thoracic markings, which are, practically, a silver "jew's harp." Some discussion has arisen as to the specific value of the fine median lines; they are, however, of little moment to us as no record has been made of these small differences in the work on Yellow Fever and the chances are that all these forms carry the disease.

Culex fatigans, a practically unmarked mosquito, is common in all warm countries, and in the United States has a very indefinite distribution, our variable seasons sometimes bringing it far north of its usual habitat. It is separated from *C. pipiens,* the northern form, by the relative length of the cell and stem of the first sub-marginal cell. It is claimed by some authorities that the American form is a different species, but as it is one of the most easily transportable species it is hard to draw any line between a possible native and the imported form.

Mansonia uniformis, a carrier of Filariasis in Africa, is a large brown mosquito with speckled wings; the wing scales are of a peculiar "bracket" shape not found in any other genus. It is a fierce biter, and even where not proven a disease carrier, as in the Philippine Islands, is a serious pest on account of its numbers and ferocity.

Before leaving the *Culicidae* I would like to call attention to the shyness of the *Anophelinae,* and to emphasize strongly the almost self-evident fact, that failure in taking members of this sub-family by no means indicates that it is not present. If malaria be present and anophelines are not taken, it is not their absence but the lack of skill and pertinacity of the collector that

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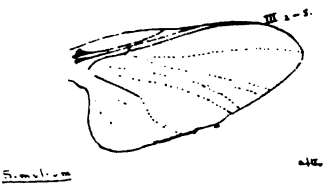
is at fault. In one of the Army Posts it took careful collections, three or four times a day for over two months, to prove the presence of *maculipennis,* although it had been indicated by constantly occurring cases of malaria for a year previous.

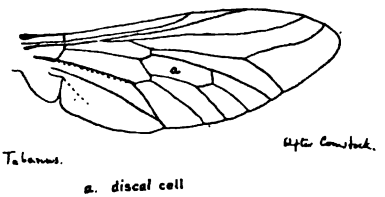
The *Simulidae* (Black flies) have only comparatively lately been considered in connection with disease.



The wing venation of *Simulium* is distinctive, more than half of the veins having coalesced so that veins III_{2-5} appear as one, the following veins being so weakened as to be little more than folds. It has gained its prominence as a possible disease bearer mostly by Sambon's work in the investigation of Pellagra.

Tabanidae (Horse flies.)

The wing venation of this group is markedly more specialized than those previously considered, and is perhaps most easily recognized by the wide-open mouth of the apical cell. It will be well to look a moment at the discal cell, not because of its value here, but for comparison with another fly later.



a. discal cell

This family has not usually been thought of as a pest for mankind, but some species undoubtedly attack man, and Austen believes that as they carry some diseases of other animals, especially in tropical countries, they may be proven dangerous to men also.

Muscidae.

Under this family there are three genera of great interest.

NOTE.—The drawings in this paper are collected from various authorities and not drawn to scale, as they do not at all indicate the relative size of the insects. C. S. L.

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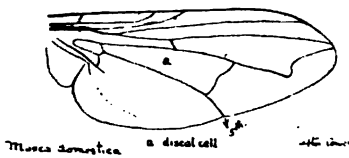
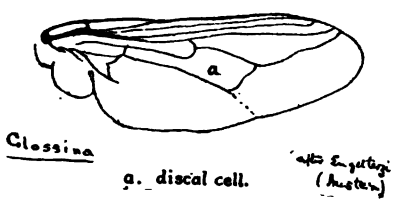
Musca domestica.

In this wing the apical cell is nearly closed, and the discal cell is large. The 5th longitudinal vein extends to the wing margin. There are several flies easily mistaken for this, the wing differences being small, so that it is advisable to add other points of difference, but this will at least serve to separate it from two other important forms. It seems probable that it is merely a mechanical carrier of the diseases with which it is associated.



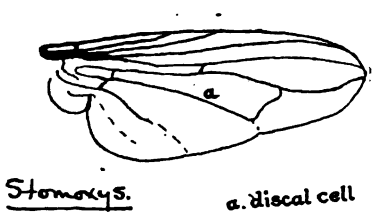
Glossina (Tse-tse fly.)

In this genus are three or four species connected with disease, of which *palpalpis* and *moritans* are the better known, and which are connected with "sleeping sickness." The wing venation is distinctive of the genus, the peculiarity being the remarkably curved course of the fourth long vein, which it seems to me is more easily recognized as a peculiarity of the discal cell, which is "cleaver shaped." The apical cell is almost closed, but that is also true in the preceding and following forms.



Stomoxys.

The wing is less peculiar, the discal cell is not unlike that in *Musca,* but the fourth long vein curves up at the apex to form this characteristic flash-shaped apical cell.



Austen calls attention to the position of the wings when the fly is alive and at rest. Those of *Glossina* lap entirely over each other, "like scissors," while the *Stomoxys* wings are divergent

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at the apex, and he says the flies may be distinguished in this way.

In glancing thus briefly at these various wings their dissimilarity is evident, but the limits of this paper do not allow the comparison of these wing-forms with those of innocuous flies likely to be confused with them, a suggestion as to the groups where this trouble is liable to occur is all that is possible.

In a general way, the "midges" (*Chironomidae*), "Fungus-gnats" (*Mycotophilidae*), and "gall-gnats" (*Cocidomyiidae*) are those most likely to be confused with the smaller forms. The wings of the "spear-winged flies" (*Lonchopteridae*) are a little like the *Psychodids,* and those of the "hump-backed flies" (Phoridae) are somewhat like those of *Simulium,* but although these resemblances must be taken into account, a little care soon accustoms one to the differences, and in some cases the general appearance of the fly will at once exclude it.

The wing of the "Horse-fly" (Tabanidae) is distinctive; there seems little likelihood of its being confused with that of any other family; *Musca Domestica,* on the contrary, is easily confused with several other flies, the wings being similar enough to be troublesome to those not used to handling them.

The "Tse-tse fly's" wing is distinctive not merely of the family and group, but of the genus itself, the peculiar discal cell being easily recognized, and is found in no other genus.

The Stomoxys wing may perhaps be confused with some having a fairly wide open apical cell, but it is really a distinctive wing.

The subject of the control of these insects is too broad for more than brief comment here. Every climate has its own conditions to meet, and the habits, feeding place, and manner of reproduction in the insect suggest the methods for control. Mosquitos cannot be greatly reduced in numbers where lowland rice is grown, and those that develop in brackish water are hard to control; the house-mosquito is a comparatively easy problem, providing there is coöperation in the fight against it. Viviparous flies, like *Glossina,* cannot be fought in the same ways as egg-laying flies. The length of flight also complicates matters; petroleum cannot be safely put on fish ponds. For real success the conditions of climate, insect, and the necessities of the people must be considered and methods evolved to fit the case in hand.

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SOME SUGGESTIONS FOR A MODIFIED IODINE CONTAINER.

By First Lieutenant SANFORD W. FRENCH, Medical Corps, U. S. Army.

THE new iodine packet which has been added as a unit to the hospital orps pouch, orderly pouch, detached service chest, etc., by the Manual for the Medical Department, 1911, is especially commendable and takes a place of utmost importance.

The uses and efficiency of iodine in surgical operations, both minor and major, are well known and it is not the object of this paper to go into that phase of the subject.

Like many new additions to the field of first aid, where cost and the saving of weight and space are important factors, the present iodine container is open to objections in a few particulars which will be detailed, after which a few suggestions will be offered which may overcome some or all of these objections.

The present glass container is too large for its contents. (Fig. 1.) Of some twenty tubes examined, not one was over half full. In but two of these tubes were the contents dry and not adherent to the sides of the container. In using any of these tubes it would be necessary to break the tube and put all the broken parts in the fluid used to insure not losing any of the contents. This might permit of admitting pieces of broken glass into the wound in which the iodine solution was subsequently used. The fact that the tubes are only half filled demonstrates the waste of space and the addition of useless weight. The expense of putting up the iodine combination in these sealed tubes must be no small item.

The following is a list of containers which might be employed with less cost and a saving of space and weight without a decrease in the stability or efficiency of the packet.:

1. Glass capsules, (Fig. 2) — {Plain, Paraffine sealed.
2. Gelatine capsules, (Fig. 2) — {Plain, Paraffine coated.
3. Glass tubes, corked, (Fig. 3) — {Cork, plain. Cork paraffined before use.
4. Glass tubing drawn at both ends, (Fig. 4)

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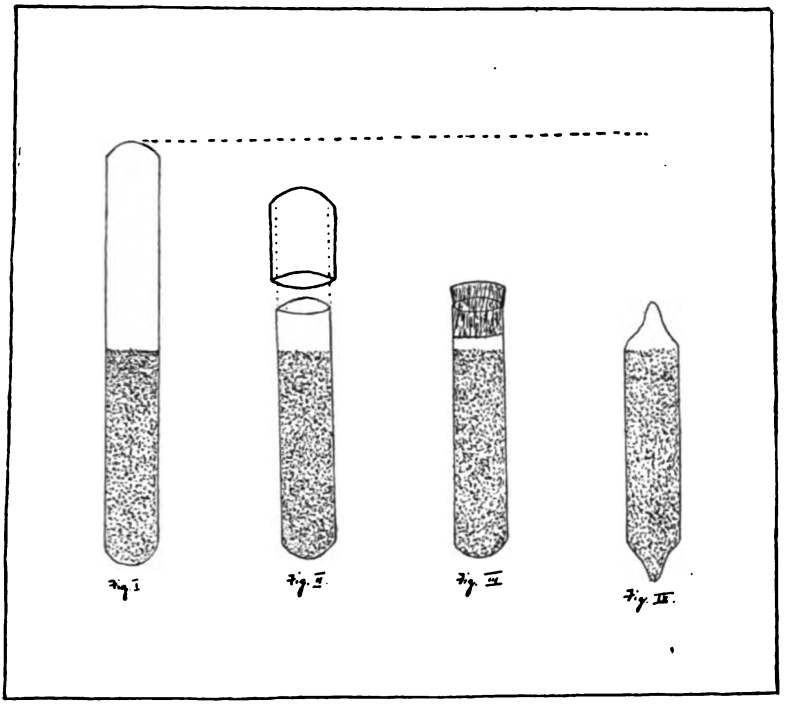

1. *Glass Capsules* (Fig. 2): These could be used either plain or by sealing the joint with paraffine after filling to keep the contents moisture-proof. To open this would require no breaking of glass and no subsequent danger therefrom. The two ends could be slipped apart and if the contents were adherent to the tube, both parts of the capsule could be dropped into the bottle of alcohol or water and the contents thoroughly dissolved without waste and without breaking the glass.

2. *Gelatine Capsules* (Fig. 2): These could be made the same size and shape as the glass capsules suggested. In cold climates, the gelatine capsules could be used plain without fear of disintegration by the contents provided the potassium iodide is free from moisture when placed in the capsule. I have had a number of plain gelatine capsules filled with the contents of the present iodine tubes (both dry and moist) for a number of days without any signs of deterioration of the gelatine. These capsules could be packed in a moisture-proof container like the present

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hard rubber medicine vial of the emergency case. A small amount of lycopodium could be shaken into the filled container to prevent the capsules from sticking together. When required for use the whole capsule could be dropped into the bottle of water, which would dissolve the gelatine capsule and liberate its contents. Gelatine is insoluble in 90% alcohol and if this was used, the capsule could be split or cut in half and then dropped into the alcohol. This capsule would probably not be efficient for tropical use, especially where the atmosphere is very humid. In the tropics, the plain gelatine capsule could be dipped in melted paraffine which, according to its degree of purity, will withstand a temperature of from 109° to 151° F., without softening. Neither iodine nor potassium iodide has any effect on paraffine nor has a combination of the two. The paraffine would also protect the gelatine from moisture. When used, the capsule could be split open or cut in half. These containers would be cheap, light in weight, would take up little space, and, what is perhaps not the least consideration, they could be prepared in any dispensary in the service.

3. *Glass Tubes Corked* (Fig. 3): This container would simply necessitate the removal of the cork, which could be paraffine coated to protect the cork from the action of the iodine and keep the contents moisture-proof, and the contents then emptied into the water or alcohol. If the contents were adherent to the tube, the whole tube could be dropped in the fluid and the contents dissolved out.

4. *Glass Tubing Drawn at Both Ends* (Fig. 4): This container could be opened by simply knocking off the tip at each end of the tube and the tube could then be dropped into the fluid. This container would be absolutely moisture-proof and on the same plan as the present container. It would present the advantage of simplicity of manipulation without the loss of any of the contents or fear of admitting broken glass into the solution. The objection to this form of container would be the necessary loss of a certain amount of iodine by the heating of the tube in sealing off the end. The tube would also have to be made longer than to actually contain the contents to carry the heat in drawing out the end of the tube farther away from the iodine, which is probably the reason for the length of the tube in use at the present time.

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SURGICAL TREATMENT OF GONORRHEAL EPIDIDYMITIS

By Major GEORGE A. SKINNER, Medical Corps, U. S. Army.

OF the comparatively mild affections which the military surgeon is called upon frequently to treat, none is much more persistent, painful and by recurrences after apparent recovery, more exasperating, than gonorrheal epididymitis. This is especially true when the patient belongs to a mounted command. The ordinary treatment by rest in bed, strapping the testicle, ice packs, ichthyol, etc., has been so unsatisfactory in my hands that an article appearing in one of the journals, by Hagner of Washington, describing his method of surgical treatment was hailed with joy, for I was at that time serving with a cavalry regiment and two light batteries in the Philippines, and a large number of cases of gonorrheal epididymitis, both acute and chronic, constantly lumbered up the sick report.

It was with considerable difficulty that the first patient was persuaded to undergo the operation. This particular patient was a civilian, and after he had suffered very acutely for three weeks, both sides being involved, he finally decided that the operation could not be much worse. He was accordingly prepared and put to sleep, the operation done, and by the time he was fully awake from the anesthetic the pain had practically disappeared. He left the hospital on the seventh day, and shortly afterward took a sixty-mile drive in a carromata over the hills of Luzon, and stated that he suffered little inconvenience.

The result of the first operation had been closely watched by several other men suffering with like infections, and the applications for operation from these men were prompt. Several operations followed in rapid succession, and without exception, the pain stopped within a few hours after recovery from anesthesia, and in some cases was gone when the patient regained consciousness. Nearly every case could walk on the third day without pain, and was up and about on the fourth day. The period of complete convalescence varied from three to five weeks; most of the men were returned to dismounted duty in from seven to ten days. When they got to full duty they rode without pain, and in no

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case has there been a recurrence. In all, about thirty-four cases were operated upon in the Philippines and twelve since I returned to the States. In two cases the thickening of the membranes was so great that difficulty was experienced in replacing the testicle, and the tension on the sutures was such that they cut through, leaving a gaping wound. These cases had no more difficulty than the others regarding pain, but the wounds healed by granulation, consequently were much slower in closing. In later cases of this type, retention sutures over buttons were placed, which served to prevent recurrences of this nature. Several cases were operated upon in the acute stage, almost at the very inception of the attack, and the results were as favorable as in the chronic cases. A peculiar coincidence noted in a fair percentage of cases was entire cessation of the discharge almost immediately after the operation.

The operation as described by Hagner is as follows:

At a point over the juncture of the epididymis and testicle an incision 6 to 10 cm. long is made through the skin and parietal layer of the tunica vaginalis. After the serous membrane is opened all the fluid is evacuated, and the enlarged epididymis examined through the wound. The testicle with its adnexia is delivered from the tunica vaginalis and enveloped with warm towels. The epididymis is then examined and multiple punctures made through its fibrous covering with a tenotome, especially over those portions where the enlargement and thickening is greatest. The knife is carried deep enough to penetrate the thickened fibrous capsule and enter the infiltrated connective tissue. When the knife is through the thickened covering of the epididymis, a very marked lessening of the resistance will be felt. If pus is seen to escape from any of the punctures, the opening is enlarged and a small probe inserted in the direction from which the pus flows, then by a backward and forward motion of the probe the opening is enlarged and the pus allowed to escape. By this method, I believe, there is less danger of injuring the tubes of the epididymis than by cutting with a knife. After the probe is passed in, pus will be evacuated by light massage in the region of the abscess and a fine-pointed syringe is used in washing out the cavity with 1 to 1,000 bichloride of mercury, followed by a physiological salt solution. The testis is then restored to its normal position, and in every case the tunica vaginalis is thoroughly washed with 1 to 1,000 bichloride, followed by normal salt solution. The incision in the tunica vaginalis is lightly closed with a running catgut suture, a cigarette drain of gauze is then inserted, the skin being brought together with a subcutaneous silver wire suture, the cigarette drain passing out at the lower angle of the wound. Silver foil and a sterile dressing are now applied and the part supported by a wide "T" bandage.

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As performed by the writer the method of Hagner is followed closely. Silk-worm gut strands are substituted for the cigarette drain as the removal causes much less pain. The operation is so quickly done that hot towels have not been used to wrap up the testicle. No silver foil was used in the early operations because none was available, and as the patients made such prompt recoveries its necessity has not been apparent. In the later operations interrupted silk-worm gut sutures have been used in closing the incision, and the mattress suture seems to be a decided advantage in preventing the inversion of the edges of the wound. In about twelve cases, argyrol, 10%, was liberally douched over the parts and through the drainage opening, but no marked difference was observed.

In almost every case either a cyst or an abscess was found in the globus major or minor or both. These are apparently the cause of the severe and persistent pain, for as soon as the tension is relieved by their evacuation, and the wound provided with drainage, the pain ceases. And this is the more remarkable when one considers the considerable trauma of the operation.

Unfortunately, the records of part of the cases operated upon in the Philippines have been lost, and the details forgotten. The records of 17 cases are, however, at hand, and represent a very fair average of the cases so far operated upon.

Case 1. Civilian. Epididymitis, acute gonorrheal, both testicles. Pus found in left globus major. All membranes on right side much thickened and congested, but no pus. Double epididymotomy, ether. Pain ceased in both testicles in about 36 hours. Could walk comfortably on fourth day. Went home on seventh day, walking with ease and without pain. Slight purulent discharge from left testicle when he left hospital. Nineteen days after operation wounds were entirely healed and urethral discharge much reduced. Has made a long and fatiguing journey overland in carromata since leaving hospital. General condition much improved.

Case 10. Soldier, Troop G. Edipidymitis left, acute gonorrheal. Pain severe for one week before operation. No pain from time he recovered from anesthetic; slept well for first time in a week. Walked to operating room on third day and drainage was removed. Up 4th day. Wound healed and he was returned to quarters (dismounted duty) 10th day. Duty 20th day.

Case 12. Soldier, Troop B. Chronic epididymitis both sides; gonorrheal. First attack of gonorrhea, but very chronic. Both testicles were

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involved four months ago and he has done but one day's mounted duty since, being on sick report much of the time. Double epididymotomy; ether. All membranes bound down and adherent; much thickened. Pain ceased immediately after the operation. Walked to operating room and had drainage removed on the 4th day, though weight of testicles was slightly painful. Globus minor on both sides was full of dark thick blood; no pus. Dismounted duty in 16 days and full duty in 32 days.

Case 17. Soldier, Troop L. Acute epididymitis, left, gonorrheal. Second attack of gonorrhea; had persisted three months when testicle became involved. Pain severe for about seven days. Epididymotomy left, ether. Membranes much thickened, globus minor especially involved. No pus, but incysted fluid found in globus minor. Pain had ceased when patient regained consciousness. No recurrence. Walked to operating room on fourth day and drainage was removed. Dismounted duty, eighth day, and full duty on 16th day.

Case 42. Soldier, 11th Infantry. Epididymitis right, gonorrheal, chronic. Epididymotomy, ether. Abscess found in globus major. Membranes thick, indurated and matted down. Pain had ceased when patient recovered from anesthetic. Walked to operating room on third day and drainage was removed. Duty, 11th day.

Case 46. Soldier, Mountain Artillery. Epididymitis, right, chronic, gonorrheal recurrent. Epididymotomy, ether. Membranes thick and adherent. Large cyst-like formation in globus major. No pus. Pain gone when recovered. Up third day and drainage removed. Duty, 15th day.

With exception of the two cases where the stitches pulled through on account of the excessive swelling, the above cases are quite typical. In the light of such results it seems almost a waste of time to temporize with such cases when operative measures offer such prompt and satisfactory relief. Pus or a cyst will be found in practically all chronic cases, and I believe the only reason why one of them was not present in all the acute cases was due to the fact that time was insufficient for formation before the operation took place.

The advantages of the operation as they appear to me are:

1st. The prompt and permanent relief from pain.

2nd. The reduction of days lost on sick report, especially in mounted troops.

3rd. The apparent permanency of the results. In the 46 cases so far operated upon there has been no recurrence.

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REPRINTS AND TRANSLATIONS

THE MEDICAL SERVICE OF THE TURKISH ARMY.*

BY OBERST DR. VOLLBRECHT BEY, KÖNIGLICH PREUSSISCHER GENERALOBERARTZT Z. D.

THE organization of the military sanitary service in campaign of the Turkish Army has been accomplished. As the reorganization of the Army is patterned after the German in every particular, it is natural that the sanitary service should also bear a German imprint.

One year ago when I was called to Turkey in order to reorganize the sanitary service in campaign, I found that practically nothing had been done in that department. In previous years there had already been attempts made to create a change in the state of affairs which then existed, namely: that the sick and the wounded were wholly without care in war time, but the commissions which were formed for this purpose did not go beyond theoretical discussions, partly because they could not agree upon the system to be introduced and partly because any definite understanding was lacking for this branch which was so wholly foreign to the Turkish Army. Thus an old pasha expressed his views as follows: "It would be the simplest and cheapest to leave the wounded to lie and die on the field as we have done in the past." But the question would always come up again because the sad personal experiences frequently encountered on the various battlefields spoke too eloquently. The medical assistance on the battlefield and in the hospitals had everywhere been a miserable failure because it was wholly inadequate and lacked uniformity of organization.

In the beginning of my activity, I found one sanitary company in Constantinople. It was quartered in its own barracks and was under the command of a captain. A surgeon directed

*Translated for the MILITARY SURGEON by Capt. L. L. Smith, Medical Corps, U. S. Army, from the *Deutsche Militärärztliche Zeitschrift*, February 20, 1912.

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the theoretical and practical instruction for which there was at his disposal a varied *matériel* of bandages and means of transportation. The soldiers had an eminently large theoretical knowledge, they were simultaneously sanitary nurses and litter bearers. This sanitary company served as a nucleus. Whenever the sanitary personnel of the lower grades were needed in the field, whether in Yemen or Albania, 50 or 100 of these soldiers were sent. They may have done good work in the hospitals but were not suited for any previously planned utilization in campaign, especially on the battlefield. This old sanitary company, the existence of which is almost forgotten, has been disbanded.

The beginning of my activity in the Turkish Army occurred contemporaneously with the preparations for the great manoeuvers of the Army Corps in the autumn of 1910, the direction of which was given over to the Generalfeldmarschall Freiherrn von der Goltz. The first order which I received was: to organize a sanitary company for every division. This had to be accomplished out of nothing for we lacked transportation and supplies. In the short time—made still shorter because of Ramasan (fasting period)—I was pleased to be able to improvise two sanitary companies in Constantinople, while it was left to the corps in Adrianople to furnish its own sanitary companies.

Moreover, I had made arrangements for the care of patients providing temporary tent hospitals and had established these at important railroad stations. Directions were given for the transportation of patients to the rear. The arrangements proved successful, especially as cholera broke out among the troops at the manoeuvers. The sanitary service ran smoothly, though everything bore more or less the imprint of improvisation. But just here lies the strength of the Turks, they can improvise quickly and practically at any given moment.

One of the sanitary companies formed by me did its work well during the skirmish, the orders were given at the proper time and thus quite a pretty picture developed on the day of the manoeuvers.

The employment of the sanitary company in the Adrianople Corps was less successful. Its organization was at fault because a proper understanding of the problems of the sanitary com-

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pany was lacking. I came upon the transportation of this formation in front of a coffee house in a village on a day on which a skirmish was to take place. The surgeons and litter bearers supplied with litters and first aid packages had hastened to the battlefield and busied themselves on the firing line. In actual warfare not one of them would have left the battlefield alive, much less have carried off the wounded. Even should they have succeeded in doing so, the chief dressing station would not have been there. No one had thought of establishing it.

In these manoeuvers I gained valuable experience and learned how and where I must begin the task demanded of me. But I could not strictly carry out the program which I had outlined. Here everything occurs in a different manner from what one thinks. My often repeated principle was and is: First to have a uniform sanitary organization in time of peace and to build upon this as a foundation a uniform sanitary organization for wartime. "But the best of individuals cannot live in peace if his evil neighbors do not choose to let him do so." Turkey is "toujours en vedette" and hence everything necessary for war is more important to her than the carefully prepared plans in times of peace, which are so often disturbed. We were compelled to begin, both side by side, the sanitary organization for peace and the one for campaign.

When the temple of Janus is open, the god Mars rules the hour, therefore the sanitary organization for war time was created first.

As I said in the beginning, the sanitary organization for war of the Turkish Army is based on the efficient and reliable German arrangements. But there are a series of peculiarities or other factors which are due to:

1. The small size of the sanitary corps of officers and the absence of a reserve sanitary corps of officers, and

2. The peculiarities of the battlefields under consideration.

The framework for the whole must be simple and flexible, corresponding proportionately to the existing strength, leaving it to the future to enlarge the structure.

Considerations of the theater of operations demand arrangements suited to the particular locality.

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Turkey has very few railroads, few passable roads, many almost impassable regions, and many different elevations. The climate in its provinces lies in two continents, and is extremely variable. The inhabitants are scattered across extensive territories, the cultivation of which remains a task for the young Turks. There are a thousand different kinds of hindrances to the demands which are made on the sanitary department in the transportation and distribution of the patients.

In the first place we must refrain from the introduction of field wagons such as one sees used in the German Army. They are entirely too heavy for the lay of country and for the draught animals (horses and mules) in Turkey. Everything depends upon organizing the sanitary assistance so that it can follow the troops everywhere. What cannot be at hand when needed is of no value.

The field sanitary formations were so arranged that they would serve equally well for use on the plains or in the mountains, that they would give protection to the wounded even there, where they could not fall back upon buildings.

Thus the following organization was created: The direction of the sanitary service at headquarters, with the Armies, with the commanding general and division commanders, corresponds exactly to the regulations in the German army, only there are fewer members on each staff; the chief surgeon of the division must get along without an adjutant. There are no official carriages, hence all must be mounted. The supplies consist of sanitary boxes (see below sanitary boxes of the Infantry battalion), litters, blankets and bandages.

The hygienist on the commanding general's staff has a microscope, bacteriological box and a large box of reagents.

(The transportable bacteriological laboratory has as yet not been established.)

Every officer and every soldier receives a first aid packet,* which

*The first aid packet of the Turkish Army consists of a gauze bandage 5m. in length, 7 cm. in width, upon which is sewed a gauze compress, while another compress is attached by a thread. It is wrapped in parchment paper and enclosed in water-tight material (according to the directions of Prof. Dr. Wieting, Pasha).

All the bandage material introduced into the Army corresponds exactly to the German pattern and is sterilized by steam without the use of antiseptics. Their preparation takes place in the factory where the bandages are made; this is connected with the training school at Gülhane, and is under control of Prof. Dr. Wieting, Pasha, who will report this in another place.

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is carried in a pocket at the front of the left lower part of the blouse of his uniform.

The personal equipment of the sanitary personnel is given as follows:

1. For every sanitary officer, white band with red half moon on the arm; one pouch for instruments and one pouch for medicines and bandages, these to be fastened to the belt supporting the sabre; report cards and lead pencil.

2. For every sanitary soldier, a white band with a red half moon for the arm; sanitary bandages, two sanitary pouches fastened to the belt of the infantry equipment, one to the saddle in the cavalry; canteen, cup and portable shelter tent.

3. For every litter bearer white bandages with a red half moon; two pouches with first aid packets and three cornered handkerchiefs fastened to the belt; a canteen, cup and portable shelter tent.

4. For every nurse:* a red half moon sewed to left coat sleeve; equipped just the same as an infantry soldier but at the sword strap a spade, saw or axe is carried instead of side arms.

The infantry regiment consisting of three battalions has at its disposal three battalion medical officers, three pharmacists and three *feldschere*. The office of pharmacist with troops will hereafter be abolished. The services of the *feldschere* who are only minor surgeons with little or only practical experience will continue to be utilized but no new ones will be appointed. The reorganization provides for a second surgeon on duty with troops.

The sanitary personnel at the disposal of every regiment consists of twelve sanitary soldiers and 48 litter bearers. The musicians are trained as assistant litter bearers. The sanitary equipment of an infantry regiment consists of:

1. With the regimental staff: an infantry sanitary wagon, the contents of which is the same as that furnished to the German army. It forms a sanitary reserve for the regiment. The entire

*As mentioned in the beginning, I found only nurses upon entering into this service. Sanitary soldiers and litter bearers were first created. In the past year we opened the first sanitary schools; now the second course has begun. The training of litter bearers takes place gradually. Today, as I write, the first model sanitary company is practicing. The progress is troublesome and difficult. We must first have a sanitary organization in time of peace before we can have practical sanitary organization for war time.

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content is packed in boxes and forms an individual load, so that all may be packed on mules, the weight for one animal being 80 kg.

2. With the battalion staff: 2 sanitary boxes with medicines and bandages, 4 litters, 4 sanitary knapsacks, 10 blankets and belts. This equipment is divided between two animals. A special model has been prepared for the sanitary boxes, the contents of which is the same as that of the sanitary wagon. The medicines as far as possible are prepared in tablet form. Considerable quantities of bandages are furnished in addition to *matériel* for immobilization, as thin wooden and wire splints. We abstain from using English and aluminum splints. The case of instruments is not furnished for the battalions.

The sanitary knapsack used is the one introduced by Senior Staff Surgeon Dr. v. Tobold.

The litter is only intended for the transportation of one person, it is folded together lengthwise and consists of pieces connected together so that nothing can be lost. The covering may be taken off. All leather has been avoided in order to make a steam sterilization possible. There are no pouches for bandages to be attached to the litter.

The equipment is intended to make first aid possible in open battle as well as in defense positions. The problem of a battalion aid station must be met as follows: The putting on of protective and supporting dressings, the immediate checking of hemorrhage and transportation to the rear. The fulcrum of medical assistance must be found in the regimental dressing station. If at all possible this should be attached to buildings, otherwise erected from portable tents for the wounded. For this purpose a number of tent poles are to be carried by the sanitary wagon. The function of a regimental dressing station is: to carry out the necessary operations (emergency amputations, tracheotomy, urethrotomy, ligation of blood vessels), to put on bandages or to perfect those already applied (plaster of Paris) and to give the wounded the first meagre shelter. We would emphatically warn against splitting up the personnel as the sanitary aid is strongest where it appears collectively.

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In the interval between battles the infantry regiment must establish a field hospital—the Turkish army is almost always in bivouac.

Independent battalions are equipped just like the infantry battalions; independent companies, for example, as machine gun companies receive, besides sanitary knapsacks, a litter, two blankets and two belts.

The sanitary equipment of the cavalry regiments is the same as that of the German army. As the Turkish cavalry has only one regiment of lancers, the emergency litter is furnished with poles of bamboo. The strength of the sanitary personnel is the same as that of the German army. This is also the case with the artillery regiments, the equipment of which, however, is different from that of the Germany artillery. Every artillery division has at its disposal one sanitary box, one litter, ten blankets, and ten belts; every battery carries a sanitary knapsack.

The sanitary boxes fully packed are built into the caisson and are delivered with the guns by the firm of Krupp. This does not correspond wholly with the newly introduced regulations but is used at present and will only gradually be replaced. Divisions of mountain batteries receive the same sanitary equipment as the infantry battalions.

The sanitary company is patterned after the German but is only half as strong. It is composed as follows: 1 captain (commanding) of the train* who has as assistants 1 lieutenant and 1 Baoch Fschauch (sergeant major); furthermore there are 2 Fschauch (corporals), 9 Onbaschi (non-commissioned officers) as patrol leaders, 108 litter bearers, 5 sanitary soldiers, 12 nurses, laborers, 1 cook, soldiers from the train for the horses and wagons, one chief surgeon and 4 surgeons. The office of troop surgeon is being abolished. They have four ambulances, one sanitary wagon, one field kitchen, the latter has only one animal, the other wagons have two. The ambulances contain 32 litters.

As a dressing tent the German model 6 has been introduced. We shall have it made a little smaller, somewhat similar to the tent introduced into Switzerland.

*The Turkish sanitary officers did not previously serve with the troops; they lacked every military training. Before the Constitution, they lacked every opportunity to gain even the slightest military knowledge. Therefore, we had to abstain for the present from giving them independent command of sanitary companies.

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We abstain from using the acetylene illuminating apparatus, as we found it too complicated for the conditions here and could not obtain the necessary supplies to keep it going. In place of it, we use lanterns with petroleum and oil, both of which could be easily obtained everywhere. As it is very difficult in this country, under certain conditions, to obtain water, it was necessary to furnish a large number of water receptacles. Each wagon carried from one to two water casks. In addition six water bags are carried in the provision wagons. The marching and order of marching of the sanitary company correspond on the whole to the German regulations. The same may be said of the arrangement of the chief dressing station and the halting place for wagons. The instruction for litter bearers has been essentially simplified; the men of one litter bear the numbers 1 to 4; the litter squad is formed by Nos. 1 and 3 and a reserve squad by Nos. 2 and 4. The labeling with head numbers, etc., is omitted.

Special regulations are given for the placing of the wounded upon the litter, their removal from the litter and the changing of litter bearers. The Turkish soldier is very clever, adapts himself quickly, and instinctively does the right thing. He works better as a litter bearer without commands than with them.

Three commands are given at the halting place of wagons,—"procure litters," "prepare to march" and "patrol (patrouille) march."

The remainder of the management can be left to the non-commissioned officer, who will see that his twelve men do not become separated. For the forward march to the field of battle we have the directions that the bearers must not appear in closed ranks, in order to avoid drawing the fire of the enemy. They must immediately scatter, use all cover and advance by leaping or crawling. It is a strict regulation that numbers 1 and 3 must march with the litter; they may carry it closed on their shoulders or drag it behind them.

On arriving where the wounded are located, the litter bearers shall direct their chief attention to rapid transportation; only in exceptional cases may they make use of their sanitary pouches, first aid packets and three cornered handkerchiefs. Other means of aid are not at their disposal.

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This is all concerning the sanitary companies provided with wagons. There were many who advised against the use of wagons. I recognized the difficulties of advancing in this country. When the rain falls for several days in this country the hard clay earth is transformed into a sticky mud in which men and animals are firmly held and in which the wheels of the wagon turn on their axles without moving forward an inch; as a result of this, every quick advance of the troops is stopped, and the cannon to which six horses are hitched remain as immovable as the train wagon to which only two horses are hitched. Hence there is no reason why the only means of transportation for wounded should not be given up. The Japanese in the Manchurian campaign felt bitterly the lack of ambulances and these are now being supplied. For a campaign in the mountains, conditions are naturally different. Here we are compelled to get along without the wagons.

The *matériel* of the mountain sanitary company is entirely transported by animals. To each animal is attached a number and a brief statement of its burden, for example, supplies for operations, apothecary supplies and bandages. In place of the field kitchen, cooking chests are supplied.

The most difficult problem for the sanitary service in the mountains is the provision of the first temporary shelter and the transportation for the wounded, especially in a country without railroads and with a widely scattered population who live in primitive huts. We will see below in the discussion of field hospitals how this problem must be solved.

The cavalry division receives its fighting sanitary equipment according to the German fashion. The sanitary supply wagons have two animals. Every army corps has six field hospitals at its disposal, which are apportioned to them on mobilizing the division. Six is a small number, but the small number of sanitary personnel and the great expenses force us for the present to be satisfied. We are dealing with entirely new establishments here.

Every field hospital is arranged for 200 wounded. The establishment is similar to that of the German field hospital with the exception of a few particulars. The content of the sanitary wagons is packed in chests; the supply wagons are furnished

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with two animals. Every field hospital has two tents, each containing twenty-five beds. The portable tent equipment should be used as much as possible; all wagons carry poles for tents for wounded. We must recognize the fact that a field hospital may have to be established in an open field without any connection with a building.

Every field hospital can be changed into two mountain field hospitals, each providing for one hundred wounded. The *matériel* is transported by animals. The mountain field hospital has only half the equipment of the ordinary field hospital.

The foremost idea was to create a column which could be most easily moved, could follow the troops quickly and establish itself where the sanitary company had erected its chief dressing station. In this way, the wounded are spared the transportation, which in the mountains is so very difficult and such a torture to them and which may unfavorably influence the healing of the wounds during the first hours or days after injury. The transporting of the wounded to the rear need not be hastened but can take place according to a definite plan.

A mountain field hospital must follow the division in échelon. The first half is given its place in marching order with the column of line troops; the second half remains with the train, thus the second half of the mountain field hospitals has greater freedom of movement; they can arrange themselves comfortably and at the same time make use of any buildings that may be found. It is intended that they should be capable of taking care of a large accumulation of the wounded.

Whether an army corps changes its complete hospitals into mountain field hospitals in the beginning or only changes a part of them depends upon the field of operation. Whenever mixed formations can be utilized it should be done. This idea reverts back to old establishments of light and heavy field hospitals.

We need only mention that regulations for collecting stations for slightly wounded and collecting stations for the sick have been given. So much concerning the organization of the sanitary service in the field.

For the sanitary service in the military district, the German regulations have been used throughout. To really convey the

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meaning of these instructions in a translation will necessitate long and troublesome work. One difficulty lies in obtaining a suitable sanitary personnel. The new military law in Turkey must give the necessary authority for this. Another difficulty lies in preparation of the *matériel*. The chief sanitary depot in Constantinople is in progress of formation. The sanitary depots of the army corps must come next. Furthermore, a sanitary depot must be established for every army inspection, for on account of the great distances and the poor means of transportation, the mobilization of military formations at the proper time can not otherwise be effected. The Linxweiler system has been chosen for the transportation of the sick and wounded by railroad. The *matériel* for sanitary trains is deposited for the present at Constantinople and Saloniki. The transport of the sick and wounded on hospital ships will play a great rôle. Turkey is accustomed to this and improvises quickly and easily.

The regulations of the military sanitary organization just developed have been printed in a book of 43 pages in the form of the German military sanitary regulations in campaign. The service regulations for sanitary companies and field hospitals follow as a supplement. The *matériel* is given in special sections. The German sanitary regulations in campaign have been translated into Turkish and form an important source of information for the general staff of the Army and the sanitary officers.

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CURRENT LITERATURE

Titles marked with an asterisk (*) are abstracted below.

FRANCE.

Bulletin de L'Académie de Médicine.

April 23rd, 1912.

1 Ecchymosis as a Sign of Fracture of the Humerous. E. Kirmisson.
2 Ultimate Results of Experimental Hypophysectomy. C. Livon and M. Peyron.

April 30th, 1912.

No original contributions.

May 7th, 1912.

No original contributions.

C. F. CRAIG.

Le Caducée.

April 6, 1912.

3 The Medical Congress of Hongkong, January, 1912.
4 *The Care of the Insane in the French Colonies. Drs. Regis and Reboul.
5 Cases of Leprosy Cured. Dr. Guillier.
6 Military Bands as an Auxiliary to Bearer Companies.

April 20, 1912.

7 Antityphoid Vaccination in the Navy.
8 Meningitis as a Complication of Mumps. Dr. C. Urdareanu.
9 Isolated Village, in the French Congo, for Patients with Trypanosomiasis. Drs. Aubert and Heckenroth.
10 Congress of French-Speaking Alienists in Tunis.
11 The French Red-Cross. Dr. Lucas-Championnière.

May 4, 1912.

12 Impressions of Spain. Dr. O. Menard.
13 The Stretcher; Its Requirements; Modes of Carriage, Particularly on the Back of the Mule.

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14 Congress of French-Speaking Alienists in Tunis. II.
15 The Sanitary Dog in Military Maneuvers.

4. **The Care of the Insane in the French Colonies.**—For the five years, 1903-1907, the ratios of epilepsy and insanity in the colonial troops have averaged as follows:

Epilepsy—Europeans, 1.64 per thousand.
natives, 0.63 per thousand.

Insanity—Europeans, 1.76 per thousand.
natives, 0.53 per thousand.

It thus appears that under exactly the same conditions insanity is three times as prevalent in the European element as in the indigenous element of the colonial troops. Another fact is made apparent, namely, that insanity is more frequent in the European element of the colonial army than among home troops. Thus, while insanity proper (excluding epilepsy, neurasthenia, hysteria, etc.) is only 0.50 per thousand at home, 0.70 in the African battalions, and 1.40 in the military prisons, it is 1.76 in the colonial troops, a ratio exceeded only in the foreign legions (2.50) and the disciplinary companies (2.80). This is explained, in part, by the well-known relation existing between insanity and the number of voluntary enlistments, the ratio of insanity being always greater in corps consisting of volunteers or containing a large proportion of them. Experience has also shown that psychopathic predispositions are notably aggravated in colonial soldiers by various determining causes, particularly the climatic conditions, malaria and other special diseases, conflicts with natives, alcoholism, etc.

Inasmuch as care for the insane, in the French colonies, is still in a rudimentary state, contrasting deplorably with what has already been done by other civilized countries, the following measures are suggested by Drs. Regis and Reboul: 1, formation of a body of colonial alienists; 2, legislation concerning the insane in the colonies; 3, establishment of asylums for the insane; 4, provisions for repatriation; 5, use of means to remove determining causes.

V. HAVARD.

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GREAT BRITAIN.

Journal of the Royal Army Medical Corps.

May, 1912.

16 Cell-Inclusions in the Blood of a Case of Blackwater Fever. Lieut. Colonel Sir William B. Leishman, F. R. S., R. A. M. C.

17 Pappataci Fever at Kamptee, C. P. Lieut. Colonel C. H. Hale, D. S. O., R. A. M. C.

18 *The Chemical Sterilization of Water for Military Purposes. Capt. V. Nesfield, I. M. S.

19 *Observations on the Modern Coal-Tar Disinfectants as Required for Service Purposes. Major C. F. Wanhill, R. A. M. C.

20 Note on the New American Infantry Equipment. Capt. N. Dunbar Walker, R. A. M. C.

21 Practical Hints on Marching and Health on Active Service. G. Fahey (late 88th Connaught Rangers).

18. **The Chemical Sterilization of Water for Military Purposes.**—The author states that he does not believe that for military purposes any method for purifying water by filtration or heat will ever prove practical, and that we shall have to depend upon chemical sterilization; also that different circumstances require different chemicals. He concludes: "(a) In the case of widespread cholera outbreaks in a civil population, where the water supply is from wells, permanganate of potash is the best drug, on account of its cheapness. All that is necessary is to faintly tinge the water pink.

"(b) In the case of standing camps, and for British troops on the march or in warfare, I consider hypochlorite of lime to be the best material, when quantities of from 50 to 100 or more gallons are sterilized at a time; it is then the cheapest method.

"(c) In the case of small detachments, when the water vessels consist of the 8-gallon mule pakhal, or the 2-gallon bucket; and in the case of officers' messes, and soda-water factories, I consider the iodine process to be the best, as being the cheapest.

"(d) In the case of individual officers, or travellers, requiring only one or two pints of water at a time, the iodine process is the best.

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"(e) For the individual soldier in times of emergency, when he is cut off from the water supply of his company or regiment, I consider the perchloride of mercury papers to be the best, as being the simplest."

The iodine process that he employs is known by Evans's name in England, by his own name in India, and by Vaillard's in France. There is some difference between the English and French method in technique and quite a material difference in the quantity of iodine used.

The English process is as follows:

Tablet A consists of potassium iodide and iodate mixed together in the proportions represented by the formula $5KI.\ KIO_3$—quantity 1½ grain per gallon.

Tablet B consists of citric or tartaric acid—quantity 1½ grain per gallon.

Tablet C consists of hyposulphite of soda—quantity 1½ grain per gallon.

Dissolve the A and B tablets together in the minimal quantity of water possible to dissolve them (10 minims for each grain). Add the resulting black precipitate of iodine and the fluid to the full bulk of water; stir. The water then becomes tinted a faint yellow. Allow it to stand for five minutes. Meanwhile dissolve in some of this tinted water the C tablet, and add to it the bulk of water; stir. The water is now tasteless and fit to drink. (There is no actual waiting necessary, as the larger C tablets take fully five minutes to dissolve). The quantity of iodine employed equals 1 in 70,000.

The water, if muddy, must first be clarified. The quantity of iodine is ½ grain per gallon, not enough to produce any injurious effect. The author states that the process has been tried repeatedly, and always found successful.

19. **Modern Coal-Tar Disinfectants as Required for Service Purposes.**—After a thorough discussion the author concludes as follows:

I would suggest the following specifications for a disinfectant:

(1) It must be non-poisonous, non-corrosive, and must not stain clothing.

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(2) It must be easily miscible with water in all dilutions. If prepared with a glue base it must not have a viscosity, as compared with B. P. olive oil at 60° F., of more than 0.3.

(3) It must not separate into layers to any great extent, if stored in bulk for a year.

(4) When mixed in working dilutions it must remain stable in emulsion for twenty-four hours with soft water, for eighteen hours with hard water, and if made up first with ordinary water for two to three hours with sea water.

(5) It must not lose more than 10 per cent of its carbolic acid co-efficient after storage for a year in hot climates.

(6) It should have a carbolic co-efficient of 10 with distilled water, and 6 when mixed with sea water or with 50 per cent urine.

ALBERT G. LOVE.

Public Health.

May, 1912.

22 Some Observations on a Town's Milk Supply. J. Coote Hibbert.

23 The Control and Isolation of Infectious Diseases in Thinly Populated Counties, and Discussion. D. Dryburgh Gold.

24 The Past, the Present, and the Future of Rural Sanitation. E. B. Hicks.

25 Observations on the Prevention of Dental Caries. J. Sim Wallace.

C. F. CRAIG.

RUSSIA.

Wojenno Medicinskij Journal.

October, 1911.

26 Observations in Surgical Clinics in Germany. K. S. Zamurawkin.

27 Ectopy of the Bladder and Prof. Ssucbotin's Operation. N. M. Jshumakow.

28 The Therapeutic Application of Prof. Denys' Tuberculin. Tsh. S. Wintch.

29 The Distribution of Tuberculosis in the Troops of the Warsaw and Petersburg Military Districts According to Anatomico-Pathologic Data. N. A. Lebedew.

30 The Problem of Simulation and Self-mutilation by Young Soldiers of Diverse Nationalities in the Russian Army. M. S. Gussjew.

31 Result of Re-examination of Recruits Called in 1909. N. S. Kozlowski.

32 *Brief Notes on the Call of Reserve Physicians to the Colors in the War with Japan. A. S. Zamjatin.

33 *A Case of Simulation of Complete Bi-lateral Deafness. S. S. Kabanow.

34 *The Treatment of Furuncles, Carbuncles and Tonsilitis with Sodium Salicylate.

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32. **Reserve Physicians in the Russian Army.**—Reserve physicians in the Russian Army, when called to the colors, were discussed in an original article by the abstracter, published in the May issue of the MILITARY SURGEON to which, in lieu of an abstract, the reader is referred.

33. **Simulation of Complete Deafness.**—Simulation of complete deafness is indeed a bold method of avoiding military service. The case was observed in 1902 in Mukden in the Reserve Field Hospital No. 165. The patient was a recruit sent for investigation and had remained six months with the diagnosis of deafness, when the author, as a member of a commission, declined to accept this diagnosis, convinced that the man was an experienced and persistent malingerer. The physicians demanded proof. This, at the moment, was impossible. The patient stated that six months ago he fell in the daytime while at drill, lost consciousness and, when revived in the barracks, found that his hearing was gone. Cause for the fall—none. Physician's examination revealed a normal soldier, physically, including the auditory apparatus. Yelling questions into his ear were habitually followed by the reply: "I hear nothing." This has been the experience of the sanitary under-personnel attached to the hospital and of his comrades in the ward. It appeared, though, that he avoided society. Gradually it was also noticed that instead of watching the lips of the questioner, as deaf people are wont to do, he watched the eyes. Finally the author called the patient by name while the latter was sound asleep and, in spite of his realization that he was "Tricked," tried to pretend he awoke spontaneously. The trick was successfully applied a second time.

34. **The External Application of Sodium Salicylate as a "Radical" Cure of Carbuncles, Furuncles and Tonsilitis.**—The external application of sodium salicylate as a "radical" cure of carbuncles, furuncles and tonsilitis is earnestly advocated by the author, who seems to have obtained most surprising results with that remedy—in one instance, for example, a man eighty years old, showing a tremendously large carbuncle of the back having refused even cross-shaped incision and was about to leave the

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hospital for the purpose of dying in his home; sodium salicylate was applied to the necrosed areas in the form of a fine dusting powder. The next day the dressing was soaked by pus and on the least pressure the typical "cores" easily left the tissues—"melted away," the author describes it. In follicular tonsilitis the remedy insufflated by a powder blower proved very useful but patients do not like the taste. In diphtheria its effect was nil.

November, 1911.

35 Observations in Surgical Clinics in Germany (Continued). K. I. Zamurawkin.
36 *A Case of Gunshot Wound of the Abdomen with Injury of the Liver, Kidney and Intestine. Recovery. P. G. Poper.
37 Distribution of Tuberculosis in the Troops, Including the Guard, of the Warsaw and Petersburg Military Districts According to Anatomico-Pathologic Data (Concluded). N. A. Lebedew.
38 Continuous Clonic Muscular Spasm Caused by Traumatic Neurosis. G. B. Jakowlew.
39 The "Phylacteries" as Producers of Paralysis of the Hands in Jews. E. W. Ericson.
40 *Brief Notes on the Call of Reserve Physicians to the Colors in the War with Japan (Continued). A. S. Zamjatin.
41 Comparative Calorie Value of Rations of the Russian and Other Armies. S. N. Angelow.
42 Disinfection by Means of Phosgen. W. W. Sseniebratow.
43 *Treatment of Gonorrhea and Its Complications by Antigonococcus Serum. S. D. Mironchikow.
44 Case of Early Appearance of Universal Military Syphilide. A. M. Tujnenko.

36. **Gunshot Wounds of the Abdomen Involving Injury of the Liver, Kidney and Intestine.**—Gunshot wounds of the abdomen involving injury of important viscera become of intense interest to the military surgeon when recoveries take place without laparotomy. When T.'s patient was brought to the hospital there was nothing to indicate the gravity of the injury, except that the paleness of the skin and mucous membranes spoke for a pronounced internal hemorrhage. Pulse, 82. Urine bloody but was voided spontaneously. The patient, a 23-year-old soldier, was brought to the hospital at 1.00 a. m. (September 30, 1910), with a bad gunshot wound of the right forearm and right half of the abdomen. Being on guard the patient removed his revolver (sys-

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tem, Smith and Wesson) and put it on the table of the guard room. He sat opposite the table. A comrade examined the gun and carelessly shot his right arm and belly. Examination showed in the lower third of forearm a bad wound of the soft parts without injury to the bones. Abdominal wound of entrance at 10th rib close to the anterior axillary line. Wound has a diameter of 0.5 cm. and bleeds freely. Muscles of injured side rigid. Percussion tone, tympanitic. Other symptoms mentioned above. Subcutaneous injection of 1,000 ccm. normal salt solution. Arm wound dressed with aseptic gauze. Wound of entrance of abdomen—the wound of exit was not found—closed by collodion dressing. An incision through the skin in the loin allows extraction of the bullet. The wound is treated by tamponade. Stormy convalescence, bile and urine flowing through the respective wounds. At the end of December complete cure.

40. **Brief Notes on the Call of Reserve Physicians to the Colors in the War with Japan.**—Vide supra.

43. **Gonorrheal Complications.**—Gonorrheal complications such as prostatitis vesiculitis, arthritis, etc., have been quickly influenced for the better by injections of antigonococcus serums. The author briefly reviews the literature on the subject and describes fifteen personal observations, though four more cases are alluded to.

December, 1911.

45 Observations in Surgical Clinics in Germany (Concluded). K. S. Zamurawkin.
46 A Case of Rare Localization of Siberian Plague. B. S. Yassinski.
47 Demonstration of Tubercle Bacilli with Antiformen. K. A. Andrejew.
48 *Brief Notes on the Call of Reserve Physicians to the Colors in the War with Japan (Concluded). A. S. Zamjatin.
49 Regarding Trachoma Bodies. A. G. Wassjutinski and W. M. Dujmsski.

48. **Brief Notes on the Call of Reserve Physicians to the Colors in the War with Japan.**—Vide supra.

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REVIEWS

THE HOSPITAL CORPS QUIZ COMPEND. A Manual for the Hospital Corps, U. S. Army, Hospital Corps, National Guard, Red Cross Association and for Students and Practitioners. By Frank C. Griffis, M. D., Medical Reserve Corps, U. S. Army. Octavo of 218 pages. Columbus, Ohio: The Edward T. Miller Company, 1912. Paper, 50c; Cloth, 75c; Leather, $1.00.

This little book should prove useful for the purpose for which it is intended. As the name indicates, it is designed especially for the hospital corps and this refer to that corps in the regular establishment and the organized militia of our land forces. Naturally, it has not been possible to discuss all subjects of importance to the hospital corps man though the author has been successful in this respect.

There is one serious objection to the book which should be corrected in future editions. The author, if we read him right, discusses medicines as though one of the functions of the hospital corps man was to prescribe for patients. In the organized militia there are, of course, a few physicians serving in the hospital corps. but aside from them and so for the great body of hospital corps men this would be a most pernicious practice. In the first place it would be dangerous, and for a second it would be very wasteful. It is principally for these two reasons a close check is kept on the expenditure of medicines in post hospitals where prescribing should always be the function of the surgeons. Subject to these remarks the book is worthy of commendation.

MINE ACCIDENTS AND THEIR PREVENTION. Illustrated by 200 pictures taken in the mines by W. B. Bunnell, official photographer of the D. L. & W. R. R. Company. For the instruction of mine-workers, especially adapted for the teaching of English to the Non-English-speaking people. Prepared by J. H. Dague and S. J. Phillips, Secretaries for the Education of Mine Workers, Young Men's Christian Association of Scranton, Pennsylvania, under direction of R. A. Phillips, Superintendent, and C. E. Tobey, Assistant Superintendent, Coal Mining Department, Delaware, Lackawanna and Western Railroad Company. Scranton, Pennsylvania: Delaware, Lackawanna & Western Railroad Company, 1912.

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This manual offers a good example of the prevention work which is being done by some of our more progressive industrial corporations. It is also intended to teach the foreign miner how to speak English. The book is very simply written and the illustrations are excellent. They show in each instance what a coal miner should and should not do in the many situations which he encounters during the course of his daily labor. Miners are proverbially careless, a condition which books of this character should serve as a factor in correcting.

THE IMMEDIATE CARE OF THE INJURED. By Albert S. Morrow, M. D., Adjunct Professor of Surgery in the New York Polyclinic. Second Edition, Revised. Octavo of 354 pages, with 242 illustrations. Philadelphia and London:: W. B. Saunders Company, 1912. Cloth, $2.50 net.

The author announces this as a first-aid book. Of course he has every right to his opinion. We, however, differ with him absolutely. First aid, except at the hands of a physician, who is not in question here, is and should be strictly limited to that first care which can be properly given by a layman. If the first-aid man goes further than this he is out of his province and it is almost certain that he will do harm and not good, thus not only injuring the individual patient, but also casting discredit on first-aid work in general. It is practically the universal experience in this country that when first aid is strictly limited it has always proved of benefit and that where laymen have gone outside first aid into the realm of the surgeon disaster has resulted. Nor can books of this character be justified on the ground that under some conditions the first-aid man may have to do the work of a surgeon because no surgical assistance can be procured. A tendency which must be constantly combatted in first-aid work is the desire to go too far and the only way this can be effected is by teaching layman's first aid only and not surgeon's first aid. Far better that the rare case far separated from a surgeon suffer than the common cases should be meddled with to an extent that will make it impossible for the most skillful surgeon to combat conditions produced by over officiousness due to faulty teaching. The book has every thing to commend it except that it is built up on what is believed to be a wholly false idea of what first aid should be.

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DISEASES OF THE EYE. A Manual for Students and Practitioners. By J Herbert Parsons, D. Sc., M. B., B. S., F. R. C. S., Ophthalmic Surgeon, University College Hospital; Surgeon, Royal London (Moorfields) Ophthalmic Hospital; Late Ophthalmic Surgeon, Hospital for Sick Children, Great Ormond Street. Second Edition. Octavo of 684 pages, illustrated. Philadelphia: P. Blakiston's Son & Co., 1912. Price, $4.00 net.

The manual under review now appears in its second edition It is a safe guide on the subject of which it treats. No words are wasted, but the text is clear and definite in all cases. The illustrations are sufficient in numbers and are good. In accordance with the general practice in books of this character, anatomy and physiology are discussed first, chapters follow on the examination of the eye, diseases of the eye, errors of refraction, disorders of motility of the eye and diseases of the adnexa of the eye. In one of the appendices the requirement for admission to the various British public services are stated.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; one time Clinical Professor of Diseases of Children in the University of Pennsylvania; Member of the Association of American Physicians, etc., assisted by Leighton F. Appleman, M. D., Instructor in Therapeutics, Jefferson Medical College, Philadelphia; Ophthalmologist to the Frederick Douglass Memorial Hospital, Instructor in Ophthalmology, Philadelphia Polyclinic Hospital and College for Graduates in Medicine. Volume I. March, 1912. Octavo of 377 pages. Philadelphia and New York: Lea & Febiger. Price, $6.00 per annum.

The present number of Progressive Medicine contains the following articles: Surgery of the Head, Neck, and Thorax, by Charles H. Frazier, M. D.; Infectious Diseases, including Acute Rheumatism, Croupous Pneumonia, and Influenza, by John Ruhrah, M. D.; Diseases of Children, by Floyd M. Crandall, M. D.; Rhinology and Laryngology, by D. Braden Kyle, M. D.; and Otology, by Arthur B. Duel, M. D.

The second section, that on infectious diseases, will probably be of most interest to the majority of our readers. The subject is exceptionally well treated.

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THE PRACTICAL MEDICINE SERIES. Comprising ten volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School.

Volume 1. General Medicine. Edited by Frank Billings, M. S., M. D., Head of the Medical Department and Dean of the Faculty of Rush Medical College, Chicago, and J. H. Salisbury, A. M., M. D., Professor of Medicine, Chicago Clinical School. Octavo of 404 pages. Series of 1912. Price, $1.50. Price of the series of ten volumes, $10.00. The Year Book Publishers, 40 Dearborn Street, Chicago, Illinois.

The present volume of this well-known series has the following sections: Infectious Diseases, Diseases of the Lungs and Plurae, Diseases of the Circulatory Organs, Diseases of the Arteries, Diseases of the Blood, Diseases of the Ductless Glands, Metabolic Diseases, and Diseases of the Kidney.

In accordance with their universal practice, the editors have done their work well in abstracting the medical literature of the year in an intelligent and conscientious manner.

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EDITORIAL

AT the present writing the reports from Cuba are of such a character that it seems quite within the bounds of possibility, at least, that it may again be necessary to send United States troops to that island. Be the outcome what it may, this condition of affairs invites our attention to the great changes which have been effected in conditions in which the Medical Department is particularly concerned since our troops first went to Cuba in 1898. It is difficult to realize that in fourteen short years more has probably been done to conserve the health and consequently the efficiency of troops (so far as this goes and it goes very far) operating in a tropical country than was accomplished in all time prior to 1898. This is more especially true of the Western Hemisphere on account of yellow fever. All physicians point to this result with pride but, on account of the very large part the medical officers of the Army of the United States have played in the solution of questions pertaining to sanitation in the tropics, they are justified in taking special satisfaction in their corps and in believing that it will be able to meet all conditions which may arise in the future. The only possibility of failure in this respect would appear to be lack of opportunity through imposing too heavy burdens on inadequate numbers or, and this appears less probable, in so tying the hands of members of the corps that it would not be possible for them to accomplish work which all evidence in the past goes to prove they are well fitted to perform.

In 1898, the method of transmission of yellow fever was unknown; now we not only know this through the epoch-making work of the Reed board, but under our able sanitary administrators yellow fever has been stamped out in regions which previously were never free of this disease. While it is true that fourteen years ago we were not ignorant of the method of transmission of malaria yet, since 1898, it must be admitted we have taken long strides forward in the practical control of this disease.

Better and more careful methods have also contributed to the

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control of dysentery. Very lately, as everybody interested knows, through inoculation, typhoid fever, the old scourge of armies in the tropics as well as elsewhere, has apparently been brought under control. Fortunately venereal diseases during active campaigning are not as prevalent as in peace times, though this is not likely to be the case in the military occupation of a tropical country. There can be no question, however, that since 1898, with equal opportunities for infection, a notable advance can be shown in methods for the control of diseases of this class.

Any discussion of advances in military sanitation would be incomplete if no reference were made to the splendid work of the Japanese in the Russo-Japanese War. What then were the lessons we should have learned from their experience? Above all else that good sanitation is a military asset of great value and that this fact should be impressed upon the entire military body of any nation if men are not to be sacrificed to disease to an extent which must seriously cripple the fighting forces. Next, if our deductions are correct, in the last analysis that good sanitation in any army at war rests very largely on the soldiers going to make up that army and not only must the teaching of personal sanitation to them have the countenance and constant support of their commanders but that measures must be taken to have medical officers instruct the men to an extent sufficient to enable them to protect their own health in campaign when no one else can do this fully for them. The methods of the Japanese to provide good water for their troops at all points from front to rear also have much to commend them. Their attempt to provide good and sufficient food was likewise a credit to them though largely through the work of some of our own medical officers it is now proved that in the light of our present knowledge a change in the composition of their ration would have prevented beriberi, the disease from which they suffered above all others combined. Another point which they emphasized was the necessity of the prompt separation of the sick from the well in diseases which are communicable from man to man. It should also be remembered that control of venereal diseases was most effective in the Japanese army. For obvious reasons their experience in this respect cannot be made of great practical value to us.

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Since 1898, it must be admitted that the surgery of war has not made progress comparable with that of military sanitation, yet we have not stood still. From the vast experience of the Russo-Japanese War it is clear that every man must be provided with an efficient first-aid packet and that he must be taught how to use it. In modern warfare conditions are such that in the majority of cases a wounded man is dependent on himself or on a comrade for his first dressing on which the fate of his wound depends, as it always has. Our first-aid dressing is believed to be the best which has yet been devised. It is well protected from contamination before it is used, and in its use ordinary care insures a clean covering for the wound. The future of the first-aid dressing is a most interesting question. Increasing its size is unquestionably undesirable from many points of view, and yet may we not be compelled to do this? With the pointed bullet haemorrhage is likely to increase and with the best sanitary service it will be a considerable time before an opportunity is given for redressing. Dressings saturated with blood will not prevent infection.

Now, are there any other important lessons making for improvement that our medical department has had the opportunity to learn during the past few years? Most decidedly this is the case. Since the Russo-Japanese War practically every nation has recognized the necessity of increasing its sanitary personnel in numbers. This is universally regarded as essential. It is also recognized that no pre-eminence in medicine or surgery or sanitation can compensate for lack of knowledge of military matters by any medical department in its own field of work.

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NEWS OF THE SERVICES

A very interesting article by First Lieutenant Henry C. Coe, Medical Reserve Corps, U. S. A. (Inactive List), appears in recent numbers of the New York Medical Journal. It is entitled, "The Inactive Medical Reserve Corps." This is not the author's first venture into this field, for on several previous occasions he has discussed the purpose and duties of the inactive officers of the Medical Reserve Corps with vigor and ability. Dr. Coe now calls attention to the fact that as at present organized and administered the inactive Medical Reserve Corps is wholly a paper organization, he pleads for practical training in the field in military matters as they affect the medical department. But if such training cannot be secured because of false sense of economy, Dr. Coe still believes that a great deal could be accomplished through theoretical instruction by map problems and the like; also by association with medical officers on duty at posts. He calls attention to the high standard now attained by regular medical officers on active service and states that one of the duties of the inactive list should be to secure good men for an army career. The whole trend of Dr. Coe's argument is that the inactive list of the Medical Reserve Corps should not merely comprise many names but that its officers have a patriotic duty to perform in making the medical service of our army truly efficient.

Captain William T. Davis, Medical Corps, sailed from New York on the 8th instant enroute to continental Europe for the purpose of doing special work in eye, ear, nose, and throat in Vienna and other medical centers.

Major C. C. McCulloch, Jr., Medical Corps, from Fort D. A. Russell, Wyoming, is spending a leave of absence in Washington.

Surgeon General Torney, Colonel Charles Richard, Lieut. Col. J. R. Kean, Major F. F. Russell, and Captains J. M. Phalen and Allie W. Williams, Medical Corps, represented the Medical Department of the Army at the Atlantic City meeting of the American Medical Association, June 4th to 7th.

Captain Lloyd L. Smith, Medical Corps, has been ordered relieved from duty at the Army Medical School and assigned to the Walter Reed General Hospital. Captain Smith will be succeeded at the Army Medical School by Captain Edgar King, Medical Corps.

Captain Arthur C. Christie, Medical Corps, recently arrived in Washington for duty as instructor in operative surgery and X-ray work at the Army Medical School.

First Lieut. Henry Beeuwkes, Medical Corps, has been relieved from duty as instructor in operative surgery and X-ray work at the Army Medical School and ordered to Ambulance Co. No. 2, at the Presidio of San Francisco, Cal.

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First Lieut. H. C. Michie, Jr., Medical Corps, at Fort Missoula, Montana, is investigating the spotted fever in that vicinity.

Major Harry M. Hallock, U. S. Army, retired, is spending a leave of absence in Washington and vicinity.

Major Edward L. Munson and First Lieut. Armin Mueller, Medical Corps, accompanying the provisional regiment of infantry, were encamped at Dubuque, Iowa, on June 7th.

Major Robert N. Thornburg, Medical Corps, recently accompanied insane patients from the Letterman General Hospital to the Government Hospital for the Insane in Washington, D. C. Major Thornburg has been granted a fourteen days' leave on completion of this duty, and spent a portion of the time in this city.

Captain Orville G. Brown and First Lieut. Corydon G. Snow, Medical Corps, arrived in San Francisco on the Transport Logan, June 9th, on leave of absence from the Philippines Division.

Lieut. Col. Thomas U. Raymond, Medical Corps, has been relieved from further duty in the Philippines Division, effective on the expiration of his present leave of absence and ordered to report at Fort Slocum, New York, for duty.

A class of thirty-eight men were graduated from the Army Medical School on May 31st, and have been assigned to stations.

Lieut. Col. Henry I. Raymond is under orders to be relieved from duty in the Philippines Division, effective September 15th. Colonel Raymond has been assigned to duty at Schofield Barracks, H. T.

Passed Assistant Surgeon J. S. Boggess, of the Public Health and Marine-Hospital Service, has been ordered to Kansas City, Missouri, and other points along the Missouri River to assist in the investigation of the relation of the pollution of water supplies to the spread of typhoid fever in interstate traffic.

Passed Assistant Surgeon H. G. Ebert, of the Public Health and Marine-Hospital Service, who for the past three and a half years has been in charge of the quarantine station at Cebu, Philippine Islands, has been relieved from duty in the Philippines and detailed for duty at the Marine-Hospital, San Francisco.

Passed Assistant Surgeon H. J. Warner, of the Public Health and Marine-Hospital Service, has been detailed to the Revenue-Cutter "Itasca."

Passed Assistant Surgeon R. H. Creel, of the Public Health and Marine-Hospital Service, has been relieved from duty at Ellis Island and ordered to Providence, Rhode Island, to take charge of the quarantine and assume the functions of quarantine officer for that port.

At the request of the Director of the Bureau of Mines, Assistant Surgeon S. C. Hotchkiss, of the Public Health and Marine-Hospital Service, has been spending some time in the vicinity of Birmingham, Alabama, examining into the sanitation of mines and the housing and sanitary conditions in mining camps.

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The Military Surgeon

Vol. XXXI. AUGUST, 1912 No. 2

ORIGINAL ARTICLES.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS EXPRESSED IN THEIR CONTRIBUTIONS.

THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE CIVIL WAR.

When Sherman Marched Down to the Sea.

BY CAPTAIN LOUIS C. DUNCAN, MEDICAL CORPS, U. S. ARMY.

FOR the general reader the most interesting campaign of the war is by common consent Sherman's famous "March to the Sea." It has been embalmed in song and story until it has scarcely less renown than its prototype of antiquity so graphically described by Xenophon. Even the name lends itself to euphonious historical literature, like Hohenlinden and Roncesvalles. While it is true that this celebrated march met with practically no opposition, that it was in Sherman's opinion a change of base rather than a campaign, that it was mainly a problem of moving trains and supplying the army, the novelty and picturesqueness of the whole undertaking still make it a never-failing source of controversy and study. However simple it looks to us now, it by no means looked so simple before it had been accomplished. Thomas hoped Sherman would not undertake it, Grant was in doubt, and Lincoln was fearful.

Being a new thing under the sun it opened a number of problems, for the supply departments, the Quartermaster, the Commissary, and the Ordnance, and also for the Medical Department. Heretofore all campaigns of importance had bases and lines of

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communications; supplies could be brought up and wounded shipped off to the rear as fast as they accumulated. Now an army of 65,000 men was to cut loose from its base and move into the enemy's country. All supplies, and what was more difficult, all sick and wounded must be carried along, or left behind in the neighborhood of Millen and Andersonville.

The medical problem was even more difficult than the others; a considerable part of the ration and forage could be gathered from the country, but medical and surgical supplies could not be gathered like sweet potatoes and corn. Transportation for the disabled was still more difficult, in fact, in a severe campaign it would have been impossible.

Severe fighting was not within the range of reasonable probability; Hood was far away and Lee could spare no man from Richmond. Sherman doubtless expected no great battles, but probably anticipated more fighting than actually occurred.

Almost everyone considered the proposed march a grave, difficult, and dangerous undertaking. It proved easy to accomplish. General Cox wrote afterwards that he remembered it as a gigantic outing or picknicking party. But after they are accomplished most great things look simple; in fact most great things are simple.

CHATTANOOGA TO ATLANTA.

While the March to the Sea was the march from Atlanta to Savannah, the campaign leading up to Atlanta is a part of the same grand movement, and a review of some of its most important medical features will be made.

For this campaign General Sherman had an army of one hundred thousand men, or rather he had three armies totalling that number. His forces were maintained in three separate armies, somewhat after the fashion of the Germans and Japanese in later days. Thomas commanded the Army of the Cumberland, three corps, with sixty thousand men present for duty. McPherson led the Army of the Tennessee, consisting of parts of two corps, about twenty-five thousand men. A third army corps joined McPherson in June. Schofield's Army of the Ohio was made up of one army corps and a cavalry division, amounting to fourteen thousand men. The Army of the Cumberland had an entity

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almost from the beginning of the war; it had fought at Stone's River, Chickamauga, and Chattanooga. The Army of the Tennessee was brought from the Mississippi and had had no separate existence. The Army of the Ohio had been organized the year before for operations about Knoxville, and now came from that place for the Atlanta campaign.

It seems a heterogenous force, but proved an efficient machine. To quote the Confederate Colonel Breckenridge: "It was a superb army, admirably equipped, abundantly supplied, excellently led. It was veteran and had known victory. It had pushed its antagonist out of Kentucky with the surrender of Donelson; had captured Tennessee, captured Vicksburg, repossessed the Mississippi, driven its foe over Missionary Ridge in flight. It knew how to fight and was willing to fight." I believe that students of tactics and strategy unite in pronouncing this campaign the most scientific of the longer operations of the war.

The separate armies had separate bases at Chattanooga, Huntsville, and Knoxville; but this plan was found to be impracticable and Chattanooga became the actual advance base for the united armies. Nashville, one hundred and fifty miles further back, was the main base, with depots at Louisville and St. Louis. All supplies were brought forward from Nashville on one line of railway, very poor and frequently interrupted. All sick and wounded had to be evacuated in the same way, except that a part of the wounded of the Army of the Ohio were sent to the nominal base of that army at Knoxville.

In 1864, the Government was well provided with general or base hospitals.

In the fall of that year there were hospitals in the Department of the Cumberland as follows: Chattanooga, 3600 beds; Nashville, 8270 beds; Tullahoma and Murfreesboro, 830 beds; total, 12,700 beds. In the Department of the Ohio there were: at Louisville, 3868 beds; New Albany, 1618 beds; Jeffersonville, 4262 beds; Knoxville, 2057; total, 11,805. The grand total is 24,500 beds and does not include many smaller hospitals at garrisoned posts. After providing for all local forces there must have been beds for from twelve to fifteen per cent of General Sherman's combined armies.

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In equipment the Army of the Cumberland excelled. General Thomas appears to have been a great organizer. He had the best supply trains, the best engineer equipment, the best ambulance and hospital arrangements, the best railway and hospital trains. The Army of the Ohio was less well provided with medical equipment, but the other armies now profited by the example of the Army of the Cumberland and improved their equipment as the campaign progressed. At the outset the brigade hospital system obtained. Medical Director George E. Cooper, U. S. A., says: "Previous to entering on this campaign each brigade had a medicine wagon and two army wagons to carry canvas and supplies for a brigade field hospital. An operating staff had been detailed and everything systematized so that during an action the wounded might receive prompt and systematic attention. The ambulance corps, organized under the new system (Letterman), had been untried."

A peculiar feature was that the cavalry divisions, numbering close to ten thousand men, were allowed no ambulances, this by order of the commanding general, who instructed that men not able to ride be left in houses, and authorized contracting for their care at the rate of one dollar gold per day. As a matter of fact, the wounded from the cavalry, not many in numbers, were cared for in the infantry division hospitals. This order was a mistake. For regimental medical supplies, although but three wagons were allowed to a regiment, one was allotted to the Medical Department.

It was the mediocre and inexperienced generals who neglected adequate medical arrangements during the war. The armies of the great leaders like Grant, Sherman, and Thomas, were always well, almost lavishly, supplied.

For reserve supplies there was a train of thirty wagons, in charge of Asst. Surgeon J. W. Craig, 10th Illinois Infantry. The Sanitary Commission also kept supplies with the army, and especially at the hospitals along the railway line. The division hospitals were organized on the basis of ten beds to a regiment of less than four hundred men. It is to be remembered that the fighting strength of the three hundred odd regiments of these armies seldom amounted to more than one-half the number borne on the muster rolls.

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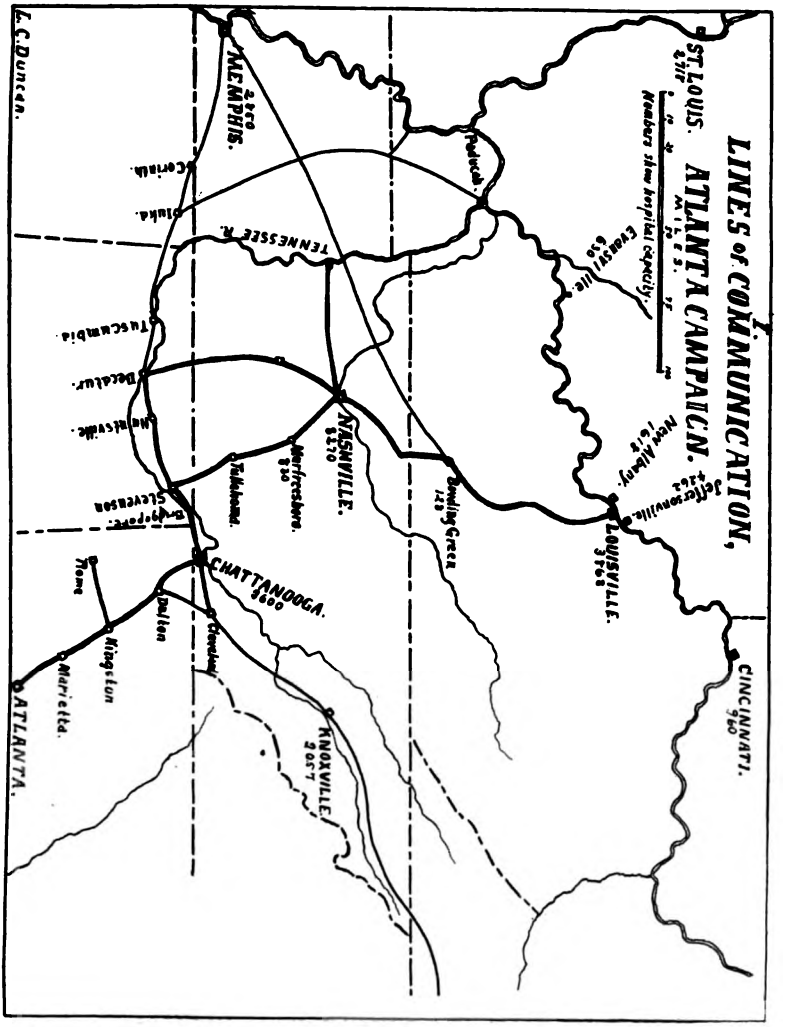

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The most interesting and instructive medical feature of the campaign was, perhaps, the evacuation of the sick and wounded to the rear as the army advanced. For this purpose the Army of the Cumberland had excellent hospital trains devised by its medical director, and a great field hospital of a thousand beds, which was what we should now call an evacuation, or clearing hospital. There were three trains of ten to twelve hospital cars each. The cars had a capacity of thirty reclining patients, and this was the only class of patients that had the luxury of a hospital car.

The car devised and perfected by Surgeon Cooper gave the most general satisfaction. It was improvised from an ordinary day coach, by turning two seats together and connecting them by slats, on which bed sacks were placed. These lower beds were for the more gravely wounded, though two patients were sometimes placed in one bed. The upper berths were like stretchers, suspended from the wall, and by rods from the roof. The less severely wounded were placed in the upper berths. It was planned to have one train leave the hospital daily. This would possibly have sufficed for the more severely wounded and sick.

General Thomas accorded the fullest authority to Medical Director Cooper to select for the hospital trains the best locomotives and cars to be found, and to have new cars fitted up when necessary. On these hospital trains the smokestacks of the locomotives were painted a brilliant scarlet; the exterior of the cabs and tenders were of the same conspicuous color.

At night, beneath the headlight of the engine, three red lanterns were suspended in a row. These distinguishing signals were recognized by the Confederates. It is said that both Generals Morgan and Forrest gave strict orders that the Federal hospital trains should not be molested, and should be given timely notice in case the road was destroyed. I know not how reliable these statements are, but can find no record of any happenings to the contrary.

As far as the records show the first official step toward organizing hospital trains was a letter written August 11th, 1863, directing the Medical Director of the Army of the Cumberland to fit up a special hospital train to run between Louisville and

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Nashville. A hospital train was already running on the same line and had been for six months or more. It was fitted up by the Sanitary Commission, as were the first hospital trains in the East.

The clearing hospital had tentage, bedding, and general equipment, but no transportation. It was brought forward along the railway, step by step, and cared for the sick and wounded until they could be transported to the rear. It generally relieved the division field hospitals in from two to five days. While the Army followed the line of the Western and Atlantic Railway in general, it left this line at times to make flanking movements; notably, before Resaca, and again at Dallas, where the right wing was about twenty-five miles from the railway base at Kingston.

The importance of keeping a large part of the rank and file of an army from drifting to the rear has been shown recently by Major Munson.

The returns of Sherman's armies are for territorial divisions, not for armies in the field. The returns of the Department of the Cumberland for April, 1864, show the following:

Present for duty	88,883	of	52%
Present sick	6,501	"	4%
Total present, not for duty	17,767	"	10%
Total present	106,650	"	62%
Absent sick	18,885	"	11%
Total absent	64,800	"	38%
Total sick, present and absent			15%

In other words, out of each 100 men on the muster rolls, 62 were present and 52 were present for duty on the firing line. Of the 48 not available at the crucial point, 15 were absent on account of sickness and 33 from other reasons.

This campaign should have begun simultaneously with Grant's advance in Virginia, but the armies had to be brought together from a distance and they were not in touch with each other until May 7th, the day after the Battle of the Wilderness. The advance base, or rail head, was at Ringgold.

The first stand made by General Johnston was in front of Dalton.

There was desultory fighting about Dalton on the 8th, 9th, and 10th, in which there were no great casualties. The clearing

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hospital was at Ringgold and remained there until Resaca was gained. On May 11th the armies left the railway to make a flanking movement through Snake Creek Gap and strike the road in Johnston's rear at Resaca. There was fighting in front of Resaca on the 13th and 14th, but the principal and successful attack was made on May 15th.

The total casualties at Dalton and Resaca were: killed, 600; wounded, 3375. Many of this large proportion of wounded must have been but slightly injured. General Sherman says it was not necessary to send many of the wounded to the rear. The wounded were cared for in the field hospitals for a few days only. The railroad was repaired by the evening of the 16th and the clearing hospital being brought up, took over the wounded and cared for them until they could be sent back to Chattanooga, or to duty.

This clearing hospital belonged to the Army of the Cumberland. The other armies were under the necessity of improvising hospitals in buildings in Resaca. Later they procured tentage and equipment for tent hospitals.

One stage of the campaign was finished; the next stage covered the territory extending from Resaca to Kingston. All the armies now advanced along the railway southward, encountering very little opposition.

Kingston was entered on May 20th and the troops rested there three days while the railway was being repaired and supplies brought up for the next step. Kingston was made a small temporary depot. When the Confederates evacuated the place they abandoned a hospital of 250 beds. This hospital was taken possession of, increased to 750 beds, and used as a clearing hospital until Allatoona was occupied.

The armies marched forward again on May 23rd. From Kingston the railway runs eastward to Allatoona, a very strong position. So the railway was left and the armies marched straight south to Dallas, carrying twenty days' supplies in the wagons. About this time rains began, and the country being in a state of nature, it was difficult to move the trains. Dallas was reached on the 25th, about twenty-five miles from the railway. Now began the series of contests lasting a week and known as the Battle of New Hope Church. Sherman says the soldiers called the rough, wooded, roadless wilderness "Hell Hole," a not inap-

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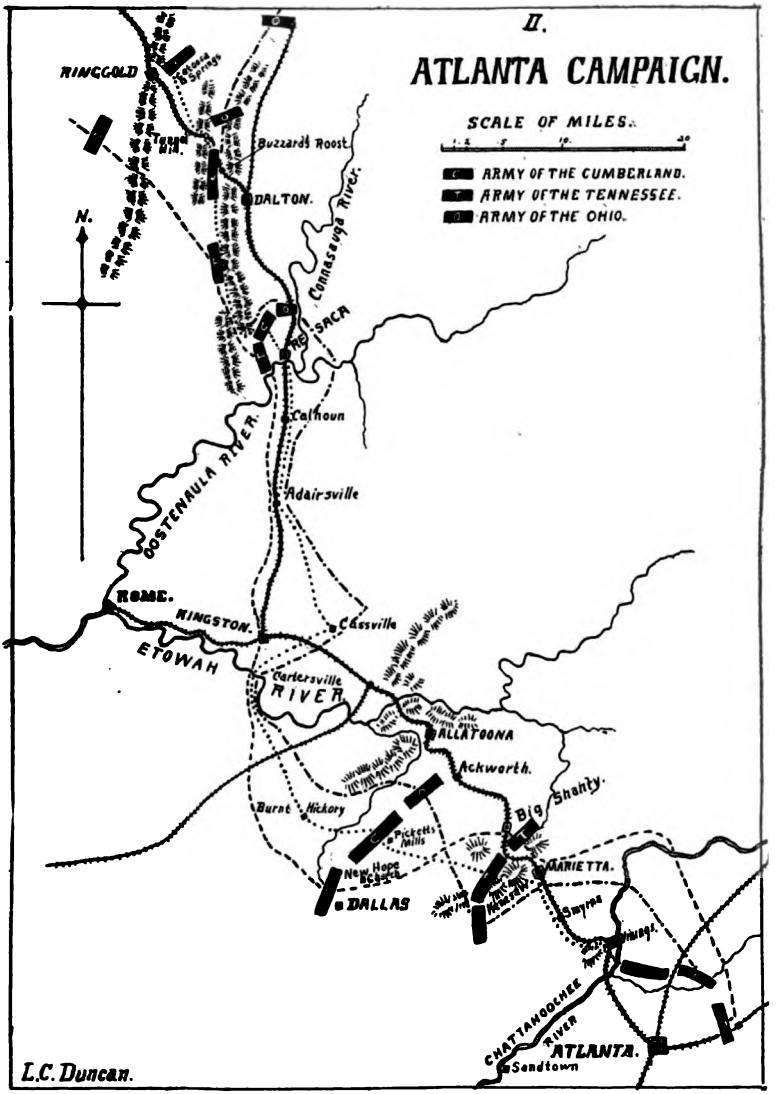

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propriate name for a trackless wild, where blind and deadly fighting was carried on for seven days without much result. There were confusing attacks and counter attacks along a front of six to ten miles and gloomy rainy weather made this woods fighting still more dispiriting.

The fighting was not decisive, but by June 1st the left wing had reached the railway in rear of Allatoona and the object of the movement was gained.

The railway was repaired and the base advanced to Allatoona by June 6th. The wounded in the battles about New Hope Church and Rickett's Mills amounted to about four thousand, but as these casualties were scattered over seven days the average number of wounded to be cared for on one day was less than six hundred in the whole army. The wounded each day were considerably less than one per cent of the entire command. Sherman and Johnson were carrying on a decisive campaign with far less effusion of blood than were Grant and Lee.

At Resaca the field of battle was near the railway and transportation was simple. Here the railway was at a distance of twenty to twenty-five miles, over almost no roads, and the weather was unfavorable. It is stated that there were 860 ambulances with these forces. The proportion is so large, one ambulance to each one hundred and twenty men, that it is scarcely credible. Those wounded in the first few days' fighting were carried back to Kingston in ambulances and wagons. The following order was issued.

HEADQUARTERS MILITARY DIVISION OF THE MISSISSIPPI,
In the Field near Dallas, May 29th, 1864.

Major Generals McPherson and Schofield:

I am directed by the General Commanding to inform you that on Tuesday next General Thomas will send to Kingston a train of empty wagons, under escort of one brigade, for the purpose of bringing forward supplies. General Sherman desires you likewise to make up a train and send it at the same time; one regiment will be sufficient guard. Send back in these wagons all your sick and wounded proper to go to the rear, and have

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your commissary and quartermaster notify the chief commissary. * * *

Instruct the officer in charge of your train to avail himself of the movements of General Blair to return to your command under cover.

I am with respect, yours, truly,

L. M. DAYTON, *Aide-de-Camp.*

Those wounded in the latter days were held in the field hospitals until the railroad was grasped at Ackworth when they were placed in temporary hospitals established at that place. As soon as the bridge over the Etowah could be rebuilt, supply trains were brought up and the wounded were sent to the rear in these box cars, without waiting for the hospital trains.

The rebuilding of the bridge was a large undertaking and was not finished till June 11th. The clearing hospital was now brought up to Big Shanty Station. The armies were supplied from several stations and again moved forward. General Blair's Seventeenth Corps arrived and joined the army about this time. His nine thousand men made good the losses thus far sustained and again raised the number of troops to one hundred thousand men.

Surgeon Cooper, who had been absent on account of an attack of malarial fever, joined the army on June 10th, at Big Shanty. Up to this time Surgeon Glover Perrin, U. S. A. had been acting as Medical Director of the Army of the Cumberland. Surgeon Cooper found the brigade hospitals still in existence. He says: "Finding that they did not work smoothly, the brigade sections were consolidated into division sections, and these placed under charge of one medical officer. This consolidation was found to be very much more practicable and economical, both in rations and medical supplies, and in care of the wounded. The innovation proved serviceable in every respect, particularly when movements were contemplated and the sick required transportation to the rear; as well as during action; for instead of being brought to the brigade hospitals, where often the surgeons were overworked, the entire operating staff of the division was at the disposal of the brigade whose loss was heaviest. The surgeons, too, had conceived the idea that their especial duty was to attend to the wounded of the regiment to which they belonged,

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or, at most, of the brigade to which they were attached. The consolidation of the brigade hospitals avoided the evils resulting from this idea, and all men belonging to the division were cared for, regardless of the brigade to which they were attached."

During the march there had been considerable sickness, particularly scurvy, but this disease disappeared when the green corn reached the roasting ear stage, and by the time Atlanta was reached there was no scurvy in the army.

On June 1st a series of rains began which lasted almost without intermission for two weeks. The miserable roads became bottomless mud holes, the troops could move by very short marches only, and the trains could scarcely be moved at all. On June 18th, Sherman wrote Grant, "It is raining as though it had no intention ever to stop." But the army moved slowly on. On June 14th, fighting began on the Kenesaw lines and continued daily until the great unsuccessful assault on June 27. This was the single general frontal attack of the campaign, yet was not nearly so deadly as the assaults at Spottsylvania and Cold Harbor. The number of wounded to be handled in the field hospitals (nineteen in number) was about 2,500. This number could have been handled comfortably under ordinary circumstances. The wounded were being transferred to the hospital at Big Shanty, but when the attack failed, Sherman again extended to the right and to do this must abandon that place. On the evening of the 27th, he ordered all wounded sent to the rear within twenty-four hours. The field hospitals were then from six to nine miles from the station and the roads were abominable. Doubtless many deaths resulted from moving the desperately wounded in this way. Medical Director Cooper says, "To obey this order it was necessary to avail ourselves of every class of transportaiton; ambulances and baggage wagons. There were at that time nearly two thousand wounded men in the hospitals of the army (Army of the Cumberland); these had to be carried from six to nine miles over roads rendered extremely rough by the rains and the heavy trains. Knowing that Big Shanty would be uncovered by the time named it was necessary to avail ourselves of every train or box cars returning to the rear. The haste in which the transfer was made caused, I doubt not, much suffering, and I regret to say that in some cases neither proper nor sufficient food was

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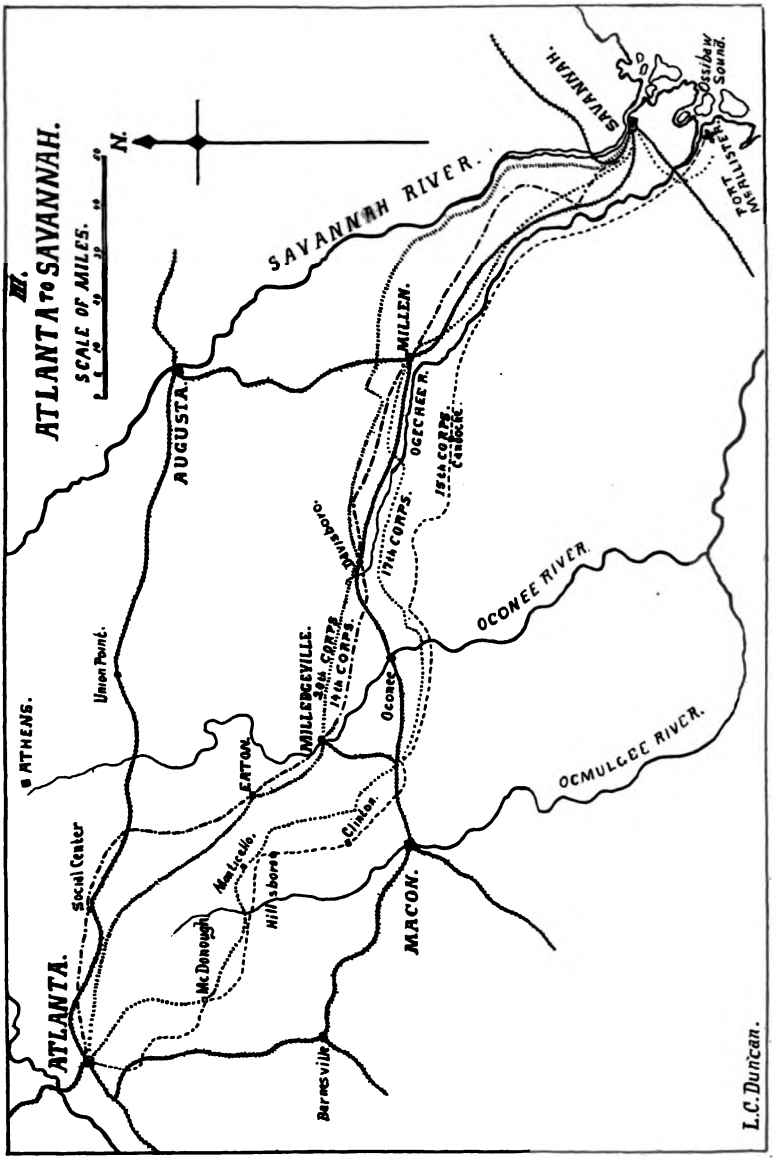

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furnished the men on the way to Chattanooga. The trip occupied thirty-six hours or more, though the distance was not more than a hundred miles. The attendants were not reliable and though there was a medical officer to each train he could only enter the cars when the train stopped."

To avoid these evils in the future Surgeon Cooper induced the Sanitary Commission to establish rest stations at Kingston, Resaca, and Dalton. The Commission promptly placed agents at these places and afterwards there was no more lack of food, water, or coffee. This arrangement shows the lack of adequate organization along the line of communications. In fact there was no organization at all. The functions of this division were performed by the service of the front, in so far as they were performed at all.

Few of these wounded were dressed from the time of leaving the field hospitals until arriving at Chattanooga, and many of the wounds became affected with hospital gangrene before reaching the rear. The Medical Director consoled himself with these reflections: "I know that many complaints have been made; it was, however, impossible to do better; the conveniencces were few, the wounded many, and the stay-at-the-rear-faultfinding patriots in excess. Everything at our command was made use of to mitigate the suffering of the troops, and it was only when the Medical Department had no control that the wounded were subject to unnecessary suffering."

On July fourth, Johnston abandoned Kenesaw, and fell back to a position about Marietta. Some slight resistance was made there and at other points further back, but on July ninth, he crossed the Chattahoochee River and retreated to the defences of Atlanta, nine miles away. The clearing hospital was brought up to Marietta, now the advance base, on July tenth, and received the wounded from these small engagements north of the Chattahoochee. The total casualties about Kenesaw Mountain and Marietta were: killed, 1,790; wounded, 5,740.

On July eighteenth the army crossed the Chattahoochee, for the last stage of the campaign, and the clearing hospital was brought forward to Vining's Station, the first station north of the river. Here it remained until the capture of Atlanta. The battles at Peachtree Creek, on July 20, near Decatur, July 22nd,

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and at Ezra Church, on the 28th, offer nothing of special interest. The wounded were sent to the hospital at Vining's Station and from there evacuated to the rear.

The last combat of the campaign occurred near Jonesboro, on September 1st, and on September 2nd, Atlanta was entered. The wounded from this battle were brought in to Atlanta three days later. Large tent hospitals were now established in Atlanta for all the troops except one division, which used the buildings of Atlanta Medical College. The wounded and sick were now held at Atlanta except in special cases.

The losses in the battles about Atlanta were: killed 1,600, wounded 5,915. These were probably the most severe battles of the four months' fighting, yet the losses do not compare with those in Virginia.

The total number of wounded cared for in the hospitals of the Army of the Cumberland was about 15,000, nearly the same as in the single battle at Spottsylvania Courthouse. Of these, one thousand died in the field hospitals, six and two-thirds per cent. If we consider the desperately wounded as ten per cent of the whole number it appears that two-thirds of this class died within a few days, or at most a week.

Of operations there were 1,286 amputations, 302 excisions, and 790 other operations. Chloroform was reported to have been used in 1,255 cases, but the Medical Director says, "This is far below the actual number as it was freely used in all cases where examination of wounds was to be made, and where painful dressings were to be applied. In no case had any injurious effect resulted from its use."

The number of sick received in the hospitals of the Army of the Cumberland during the four months' campaign was 43,153. Of these, 25,184 were sent to the rear, about sixty per cent. The balance were treated in division and clearing hospitals until returned to duty. I am unable to determine what proportion of the wounded was sent to the rear, a piece of information that would be of value.

The wastage of men during active campaign is shown by some figures from the report of the Medical Director of the Second Division, Twentieth Corps. On clearing the division of all sick on May 3rd, there were present for duty, officers and men,

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7,043.

By Sept. 1st, the division had lost: killed, 331.
wounded, 1,923.
sick sent to rear, 1,000.
total, 3,254, nearly 50 per cent.

All the wounded were not sent to the rear; we might assume that forty per cent of the wounded remained with the command, leaving a net loss of about thirty-three and a third per cent, or a rate of one hundred per cent per annum, a loss that would, but for reinforcements, have wiped out the army in one year.

The total losses in the combined armies for the four months were: killed, 4,423; wounded, 22,822; total 31,687. This is 31.6% of the whole force, much less than Grant lost in the first ten days of his campaign at the same time. Since those lost through sickness would more than balance the wounded that returned to duty it will be seen that the wastage in the whole army was equal to, if not more than, one-third.

In the South African War the wastage in the British forces was at the rate of forty per cent per annum, and from the latest data it was but twenty-four per cent in the Russian armies in 1904-5. The latter figures are in my opinion unreliable and should be corrected to admit forty per cent.

There was a considerable amount of sickness in Sherman's army during this campaign, much more than in his later campaigns to Savannah and through the Carolinas. The number constantly sick cannot well be estimated, but the admission rate was about 2,000, or about double the present peace rate of the army. Scurvy in a mild form was generally prevalent, caused by subsisting on the restricted field ration. In July the Medical Director of the Twenty-third Corps estimated that twenty per cent of the men of his division were affected with this disease. Typhoid also was not absent. A sad incident of the campaign was the death of General Ransom, as related by General Sherman. "He was not well when we started from Atlanta, but he insisted on going along with his command. His symptoms became more aggravated on the march, and when we were encamped near Gaylesville, I visited him, in company with Surgeon John Moore, U. S. Army, who said that the case was one of typhoid

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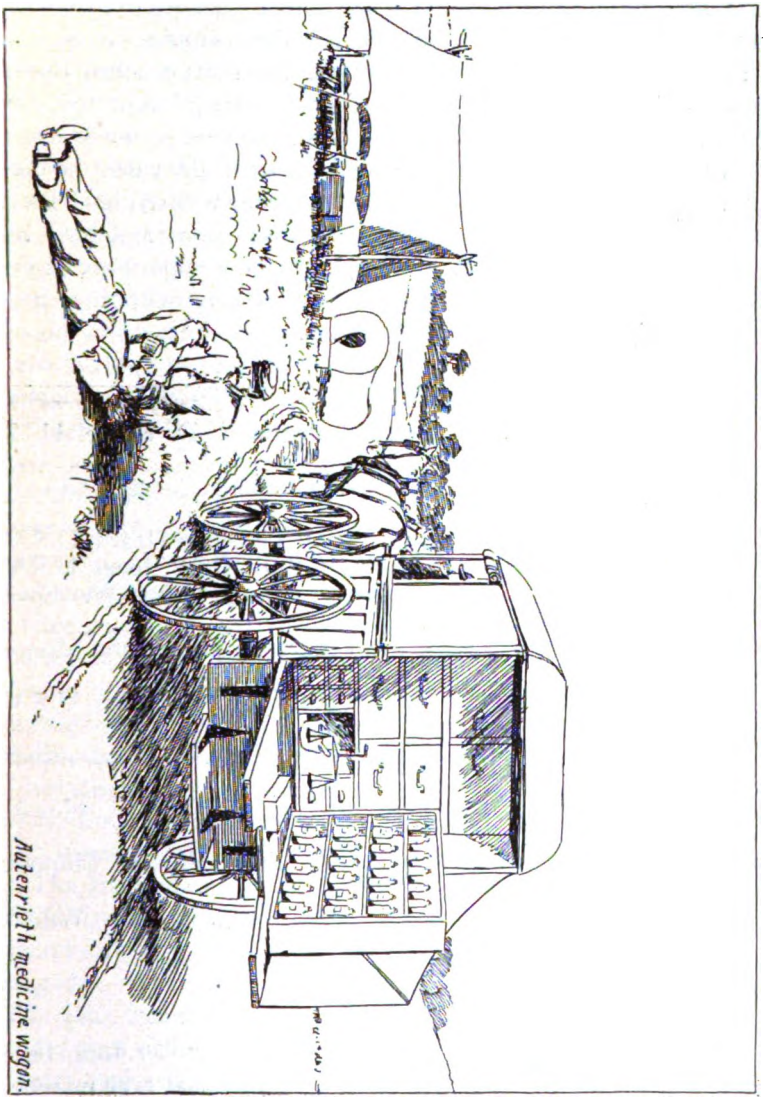

Autenrieth medicine wagon.

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fever, which would probably prove fatal. A few days after, viz., on the 28th, he was being carried on a litter towards Rome, and as I rode from Gaylesville to Rome, I passed him by the way and spoke with him, but did not then suppose he was so near his end. The next day, however, his escort reached Rome, bearing his dead body. The officer in charge reported that shortly after I had passed, his symptoms became so much worse that they stopped at a farm house by the roadside, where he died that evening." The idea of a man suffering with typhoid fever being carried in an ambulance for thirteen days, and until his death, is a strange one. It also emphasizes the importance of enforcing general orders in the case of officers with the same regularity as in the case of enlisted men.

MEDICAL OFFICERS, ATLANTA CAMPAIGN.

Medical Director of the Army, Surgeon E. D. Kittoe, U. S. Army.
Medical Director, Army of the Cumberland, Surgeon Geo. E. Cooper, U. S. Army.
Med. Director, Fourth Corps, Surg. J. Theodore Heard, U.S.V.
Fourteenth Corps, Surg. C. W. Jones, U.S.V.
Twentieth Corps, Surg. John W. Foye, U. S. V.
Medical Director, Army of the Tennessee, Surg. John Moore, U. S. A.
Med. Director, Fifteenth Corps, Surg. C. W. McMillen, U.S.V.
Sixteenth Corps,
Seventeenth Corps, Surg. J. H. Boucher, U. S. V.
Medical Director, Army of the Ohio, Surg. H. S. Hewitt, U. S. V.
Med. Director, Twenty-third Corps, Surg. Edward Shippen, U. S. V.
Cavalry Division, Surg. A. M. Wilder, U. S. V.

THE ARMY.

When General Sherman left Atlanta on November 15th, 1864, he led what was probably the best large army that ever marched under the United States flag. He had veteran regiments and tried veteran leaders. The law of the survival of the fittest had here its last exemplification.

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Regiments of a thousand men were now reduced to little more than three hundred, but three hundred of the kind of men that survive three years of war, three years of heat, cold, dust, mud, fatigue, disease, wounds, and I almost said death; for they had played with death and beat the game, like Kipling's crew of the Bolivar, who "Euchred God Almighty's storm, bluffed the eternal sea."

The weak, the inefficient, the cowardly, the infirm of purpose had long since disappeared. Those who remained were vigorous, hardened veterans who could be depended on to go anywhere and do anything possible to be done by men. As Corse had replied to the French, they were prepared for the effusion of blood whenever it was convenient. They were also prepared to take care of themselves and maintain their health and strength under any and all conditions.

Sherman himself said, "The most extraordinary efforts had been made to purge this army of non-combatants and of sick men, for we knew well that there would be no place of safety except with the army itself; our wagons were loaded with ammunition, provisions, and forage and we could ill afford to haul sick men even in the ambulances. So that all on this exhibit (table of forces) may be assumed to have been able-bodied, experienced soldiers, well armed, well equipped, and provided as far as human foresight could, with all the essentials of life strength, and vigorous action." A knowledge of these things will enable one to understand the exceptional freedom of this army from disease, and will also explain in part its great superiority over McClellan's forces in the Peninsular Campaign, where the sick numbered 20% of the command.

The army numbered about 55,000 infantry, 5,000 cavalry, and 2,000 artillery; a total of 62,000 men. It consisted of four infantry corps of about 14,000 men each; a cavalry division of two brigades, fourteen regiments; and sixteen four-gun batteries. The four infantry corps were divided into 13 divisions, 36 brigades, and about 173 regiments. The average number in an infantry regiment was 320 men, in a brigade 1,500, and in a division about 4,200. The average number in a regiment of cavalry was 360, in a battery 113 men. There was one officer to each 22 men in the whole army. The average number of officers

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to a regiment of ten companies was fourteen, allowing little more than colonel, staff, and one officer to each company, of about thirty-two men.

The medical department was fully organized in accordance with the Letterman plan.

IMPEDIMENTA.

Three years of war had also taught the leaders of this army that baggage and supplies are what Cæsar called them, impedimenta, a necessary evil to be reduced to the lowest terms. Sherman himself had no hazy ideas on the subject. He believed that tents were a luxury, for camp use only, not to be carried into the field. Before beginning the Atlanta Campaign he issued General Order No. 7 which, among other things, directs: "In no event will tents be carried, or chests, or boxes, or trunks." "Wagons must be reserved for ammunition, cooking utensils, and rations."

Officers could only take such baggage as they could carry on their persons or on led horses, and were to subsist on the same rations as the men. In a letter to Quartermaster General Meigs, Sherman wrote, "I prefer no tents at all for marching troops, * * * Soldiering, as we have been for the past two years, with such trains and impediments, has been a farce."

He had but one wagon for the entire headquarters of the army at that time. Sherman's idea of transportation for an army could hardly be improved on. It was, roughly, as follows:

1. Ammunition wagons, to carry required number of rounds.
2. Supply wagons, with twenty days' ration of hard bread, sugar, coffee, salt, and a little bacon.
3. Beef, on the hoof.
4. Supply wagons to haul a small grain ration for the animals.

An army with trains of this size could march freely. It may have been overdone in some small particulars. One of the chief surgeons complained that all cooking utensils were left behind save only coffee pots, frying pans, and camp kettles, thereby injuring the digestion of the men. I fear he would have difficulty in procuring witnesses to this alleged fact from the State of Georgia.

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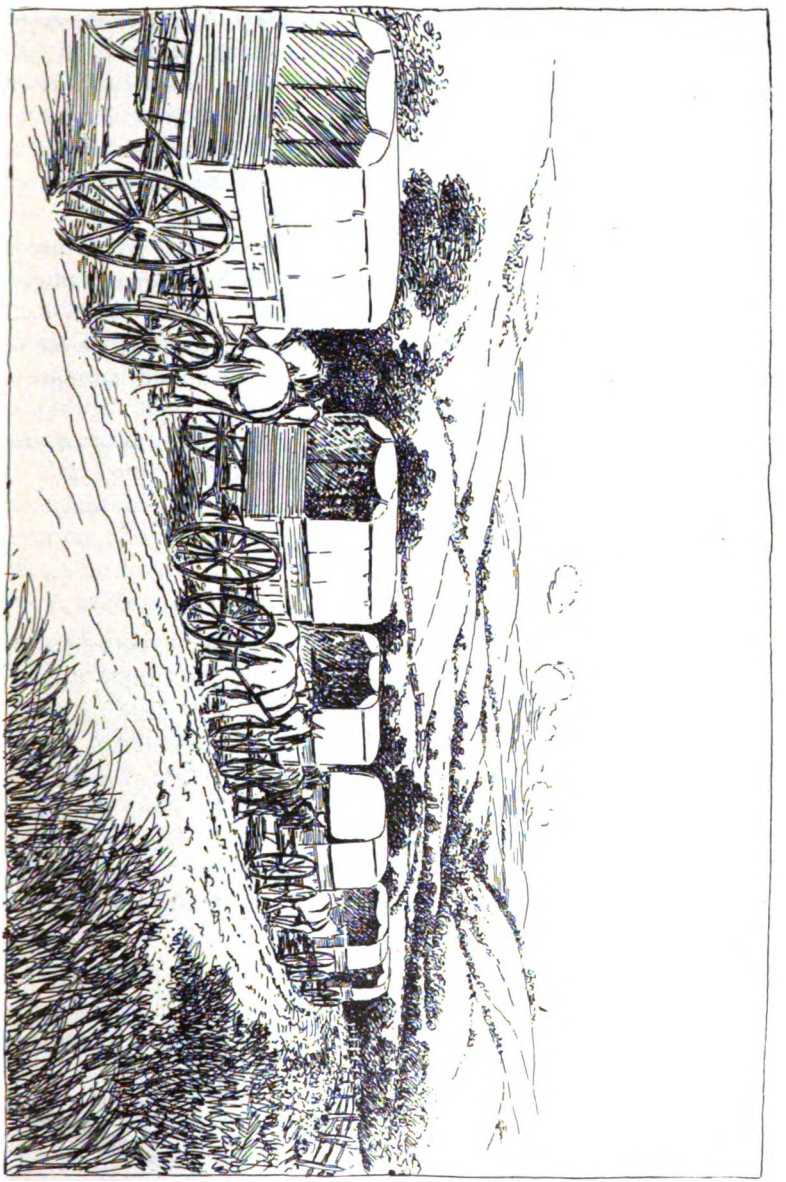

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The train that left Atlanta actually consisted of 2,500 wagons and 600 ambulances. There was no army train; each corps marched on a separate road with its own trains, and was in fact a complete army in itself, except for cavalry. Each corps train consisted of 600 wagons at the beginning, and grew longer as the march progressed. The train, including ambulances, was from four to five miles long. About 20% of the wagons carried ammunition; the balance rations and a little forage.

The average number of horses and mules in the whole army was 30,000. Each gun and caisson had eight horses, each wagon six mules, and each ambulance two horses. The average load for a six-mule wagon was 2,500 pounds. All the animals were in very poor condition at the beginning of the march, but grew better and better as the time passed.

The rations carried on the wagons at the beginning of the march were about as follows:—

Twenty days' hard bread.
Forty days' sugar and coffee.
Eighty days' salt.
Forty days' beef on the hoof.

The army started with 3,476 cattle and reached Savannah with more than 10,000, being thirty-four days between supply depots. These items make up the essentials of a ration, excepting fresh vegetables, which were gathered freely from the country, sweet potatoes being the most important component. Corn, wheat, and later rice were gathered in large quantities; mills along the route were taken possession of and run night and day to furnish flour and meal. General Sherman's order read, "The army will forage freely," and it was done much more freely than he intended. Hardly a day of the march was without its reiterated order to restrain irregular looting, but the very regularity of these orders shows that they were ineffective. Yet all this destruction was striking down the Confederacy, and sweet potatoes and turkeys, even mules, are cheaper than blood.

MEDICAL EQUIPMENT.

Now as to medical equipment. Judging by the difficulty experienced today in securing transportation for medical organi-

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zations, and by General Sherman's forcible expressions on the subject of baggage, what do you suppose would be allowed by him in the way of medical equipment? The natural impression would be—very little. As a matter of fact General Sherman's army carried about as heavy a medical equipment as our late San Antonio army. When the army left Chattanooga in the Spring each division (about 6,000 men) had a field hospital carried on six wagons. For this campaign the number of wagons was reduced to three, with one medicine wagon. This was done chiefly by cutting out the tents, taking only the tent flies. I shall enumerate the medical equipment of a sample division; the First Division, Twentieth Army Corps. This division had a much smaller equipment than the average of the army. The division consisted of three brigades, fifteen regiments, and at the beginning of the march numbered 5,289 men.

The entire train consisted of 177 wagons, of which 38 carried ammunition. The division hospital was carried in three army wagons and one medicine wagon. The hospital had sixteen tent flies—no tents. The wagons carried a thirty days' supply of the most necessary medical articles.

Each regiment had a pack mule for its medical supplies. The ambulance corps was completely organized in accordance with the Letterman regulation.

The division corps was commanded by a captain, with a lieutenant for each of the three brigades; these officers being detailed from the line to the Quartermaster Department for this purpose. There were thirty two-horse ambulances, one for each 193 men. The ambulance corps numbered about one hundred men. The ambulances carried 200 pounds each of hard bread and meat extracts for the hospital, and these things proved very useful.

As there was an excess of ambulances at the beginning of the march there is no reason why some of them should not have been loaded with supplies at the beginning, knowing that the supplies would be gradually used as the ambulances became needed.

On the basis of this division one of our modern divisions would have 14 wagons and 100 ambulances, instead of 62 wagons and 48 ambulances, as at present. I believe that a happy medium of 24 wagons and 60 ambulances would be better than either.

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During the latter part of the march three additional wagons were attached to each field hospital for the purpose of carrying the arms and equipment of "light duty" men. The division medical transportation was then measurably greater than at present.

The ambulances seem to have been kept together in one train with the field hospital, but one ambulance followed each regiment. A medical officer and a hospital steward accompanied the ambulance train on the march. The chief surgeon reported that the sick were plentifully supplied by the hospital men foraging. Carriages were taken from the country for the use of the wounded when necessary.

As to tent flies and light equipment, it is to be remembered that the climate of southern Georgia is temperate even in winter. It proved to be fine during nearly the whole of the march, with little rain, and just cool enough to be healthful. No hardships were experienced from lack of tentage or other medical supplies usually carried with armies. The troops reached Savannah in such excellent condition that General Grant was moved to express his gratification on at last seeing an army that could on finishing one campaign immediately begin another, without first recuperating for several months.

THE MARCH.

Next to fighting, marching is perhaps the most important function of armies. The manner of accomplishing a great march is always instructive as well as interesting. It may be said in the beginning that this march was hindered by no extraordinary obstacles. The difficulties were chiefly three—moving the trains, destroying railways, and gathering supplies. Together they reduced the rate of march to ten or twelve miles per day. But for these distractions, along with road making and bridge building, it seems that the army could easily have marched twenty miles per day. The order of march prescribed for the Fifteenth Corps at the beginning of the march was as follows:—

ADVANCE GUARD.

Second Brigade, less one regiment.
One battery, without caissons, wagons, or forges.
One regiment as support to the battery.
Pioneers, with tool wagon.
Regimental wagons and ambulances of these organizations.

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MAIN BODY.

First Brigade (First Division), each regiment followed by one ammunition wagon, one ambulance, and one regimental supply wagon.

One-half the division supply train—five wagons, infantry ammunition (guarded by one regiment).

Third Brigade, wagons and ambulances as with First Brigade.

Corps Headquarters train.

Headquarters trains of division and brigades (First Division).

Ambulance and hospital train, First Division.

One-half the division supply train; remainder of ordnance train (guarded by one regiment).

One regiment of Third Brigade.

SECOND DIVISION.

First Brigade, ambulance and two wagons following each regiment.

One-third of all trains.

Second Brigade, same order.

Third Brigade, same order.

Artillery Brigade and train.

THIRD DIVISION.

One regiment of Second Brigade.

Pioneer troops with tool wagon.

Remainder of Second Brigade.

Two regiments of First Brigade.

Ammunition train.

Division Headquarters train and provost guard.

Division supply train.

Ambulance and hospital train.

One regiment on flanks of trains.

Two regiments of First Brigade.

General Sherman's original order provided that one ambulance should follow each regiment with the remaining ambulances following the brigades.

This order was followed in some cases, but in most of the divisions after providing each regiment with an ambulance, the remainder were collected in a division train, usually placed near the middle of the division.

The order of march is given at length in order to show the place of the ambulances and hospitals in the column.

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The regular day's march was fixed at a maximum of fifteen miles and was more frequently not attained than exceeded. The men could have easily marched farther, but the trains could not keep up, especially at the beginning when the animals were in very poor condition. Again it was the work of building bridges or destroying railways. It was a common occurrence to assign to a brigade the destruction of two miles of railway, as a beginning of the day's work, after which the march was to be made.

Sherman always claimed that the cavalry did not do this work effectively and saw that his infantry left no rail untwisted. There was also bridging and road work, but nothing to compare with what was done in the Carolinas later. A table of the marches of the Twentieth Corps shows at a glance the distances covered by that part of the army. The other corps marched by different roads, but on the whole made equivalent marches.

MARCHES OF THE TWENTIETH CORPS.

November	15th,	16 miles,	weather fair
	16th,	8 "	" "
	17th,	16 "	" "
	18th,	15 "	" "
	19th,	7 "	rainy
	20th,	12 "	"
	21st,	13 "	"
	22nd,	15 "	weather fair
	23rd,	rested in camp	
	24th,	13 miles,	" "
	25th,	8 "	" "
	26th,	12 "	" "
	27th,	15 "	" "
	28th,	12 "	" "
	29th,	9 "	" "
	30th,	10 "	" "
December	1st,	13 "	" "
	2nd,	11 "	" "
	3rd,	15 "	" "
	4th,	15 "	" "
	5th,	6 "	" "
	6th,	13 "	rainy
	7th,	10 "	"
	8th,	10 "	weather fair
	9th,	9 "	" "
	10th,	10 "	" "

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It will be seen that in the twenty-six days from the time this corps left Atlanta until it arrived in front of Savannah the troops had but one day's rest, and, if I remember correctly, two of the divisions were busy that day. In the twenty-five marching days the corps covered 293 miles, not quite twelve miles per day. This looks like rather poor marching, but considering all other work done is very good marching indeed.

General Sherman prescribed that the column should start at seven A. M., and it frequently started earlier. He says they generally got into camp by noon, but this applies mainly to the leading division. The rear division, as usual, had the worst of it, often not getting into camp until long after dark and sometimes not till next morning. To remedy this state of affairs, Circular No. 14 of the Fifteenth Corps prescribed that the leading division should not march over two miles per hour, allowing a rest of five or ten minutes at the end of each hour. It was also prescribed in army orders that the trains should have right of way on the roads, the men marching at the sides of the road or in the fields if necessary. The immense number of animals with the army at the end of the march shows that an unusual proportion of the troops were mounted. It was a common occurrence to take advantage of the crossing of a river to dismount all unauthorized riders, and when the cavalry became short of horses the general ordered 800 turned over to them *by the infantry.*

MEDICAL ARRANGEMENTS OF THE MARCH.

General Sherman states in his Memoirs that there were about six hundred ambulances with the army—one to each 103 men. Each division had from thirty to forty ambulances, but it must be remembered that the regiments were very small. The regiments required nearly half the ambulances for regimental purposes. The quota of one ambulance to a regiment was alone greater than our present allowance of one to four hundred men.

The fifteen to twenty-five ambulances remaining formed the ambulance train of the division. The statistics of sick and wounded on the march show that the number of ambulances was sufficient.

Asst. Surgeon David L. Huntington, U. S. A., Acting Medical Director of the Army of the Tennessee (right wing), reported

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that the average percentage of men unfit for duty in this half of the army was 1.9. The percentage for the whole army may be assumed to be the same, or approximately 1200 men constantly sick during the march. Six hundred ambulances would of course carry this number easily. Considering the slightly wounded and sick it would appear that not more than one-half the ambulances were necessarily used.

Some of the wounded were carried considerable distances. The principal fight of the march occurred near Macon on November 22nd. The wounded, about forty in number, were carried along the remaining 190 miles to Savannah, reaching there eighteen days later. General Walcutt, the hero of this combat, was wounded in the leg and rode the balance of the way in a carriage.

Medical Director Moore said later: "As far as I am informed there is no case of sick or wounded men being left on the way. When the army cast loose from everything in the rear, on the campaign from Atlanta to Savannah, probably one of the gravest objections to it in the minds of both officers and men, was the dread of being left in case of sickness, in the hands of their enemies. But neither on that campaign nor on this (the Carolinas) has this fear been realized, except in the case of two men from the right wing who had compound fractures of the thigh, and were left in friendly hands in Georgia." General Sherman believed, whether correctly or not, that many people in Georgia were growing tired of the Confederacy and were well disposed toward the United States Government.

HEALTH OF THE COMMAND.

The health of the army was excellent throughout the march, as appears from the constantly sick rate of 1.9% in the right wing, which is less than half that in the United States Army today. To be sure, all sick were weeded out at the beginning. That this clearing out was thorough is shown by the fact that from the right wing there were thus eliminated 784 men, or 2.6% of that army.

All external conditions of roads, terrain, climate, and season were favorable. The constant movement rendered ordinary camp sanitation easy and the abundance and variety of food gathered from the country prevented all diseases of nutrition; scurvy was very common during the Civil War.

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The constant occupation of the men no doubt contributed to their health, as well as their confidence of success and good spirits.

The deaths from disease were at the rate of about twelve per annum per thousand; a low rate for any time, and especially low for that time. I do not believe that any large army has ever had so low a rate as this either before or since. The justly lauded German Army had a death rate of eighteen per thousand in the Franco-Prussian War.

Certain diseases appeared but apparently did not spread. There was measles in Atlanta when the march began and a case of varioloid appeared on the third day. Immediately all not protected were vaccinated—showing that vaccine material was carried in the medical supplies.

I can find records of very few men left behind. Two men with broken thighs were of necessity left, and Captain Norton, of the 10th Ohio Cavalry, having been severely wounded, was left near Waynesborough, on December 4th.

General Kilpatrick left a corporal with him, bearing a note to General Wheeler. The captain died soon afterwards and Wheeler returned the corporal. This amenity of war was accompanied by some rather sharp correspondence.

That the general officers of the army were not unmindful of the health of their men will be apparent from the following order of General Osterhaus, commanding the Fifteenth Corps:

Hdqrs. Fifteenth Army Corps,
Opposite No. 3, Ga., December 6, 1864.

Special Orders, No. 191.

I. Division commanders will proceed at once to collect all milk cows in vicinity of their respective commands, and will retain possession of the same until the army arrives at its destination, when they will be turned over to the medical department for the benefit of the sick and wounded.

II. The following are the orders for the movements of the corps tomorrow, * * *

By order of Maj. Gen. P. Joseph Osterhaus.

L. F. WHITEHEAD,
Adjt. General.

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The Medical and Surgical history of the War gives no report of the Medical Director of the Army in this campaign. It does give one short letter from him to the Surgeon General. I believe his ability may be judged from this letter, and think it worth repeating:

Atlanta, Georgia, November 10th, 1864.

SIR: I have been ordered by General Sherman to report to him as medical director of the entire army under his command. In three days the army will move into the interior of the State, having for its objective point some important town on the Atlantic seaboard. Transportation has been reduced to the minimum, and in consequence, only a limited amount of supplies can be carried on the march. In view of the probability of those on hand being exhausted when the objective point is reached, I respectfully suggest that three months' medical supplies for sixty thousand men, as well as the fixtures for fitting up a hospital of five thousand beds be held in readiness to be shipped without delay, and without further requisition, to Savannah, or such other point as the army may make its appearance on the seaboard. Our movements will probably be learned through rebel papers.

Very respectfully your obedient servant,

JOHN MOORE,

Surgeon, U. S. A., Medical Director, Department of the Tennessee.

To the Surgeon General U. S. Army.

When the army reached Savannah only about one-tenth of these beds were actually needed, yet their provision was an act of the broadest wisdom. On reading the request for this hospital and supplies the question will arise—why was Montauk Point?

COMMENTS.

For purposes of comparison, Sherman's army may be considered as composed of four divisions. His infantry corps were almost precisely equal to our modern infantry divisions. The cavalry was not attached; the artillery contingent was decidedly

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less (about one-third); engineer and signal troops were mainly detailed from the infantry. In spite of all orders there seem to have been civilians with the army, and the hospital and ambulance troops were not included in the strength as given.

If we call Sherman's corps divisions, his divisions brigades, and his brigades regiments, we have a ready basis of comparison with our modern army. On this basis he should have had sixteen field hospitals and sixteen ambulance companies. He had fourteen field hospitals. Instead of the 192 ambulances which our regulations would give him, he had by his own statement 600. As he expected no severe fighting the light field hospitals were sufficient, and were eminently suited to the campaign. The ambulances proved ample in numbers. I am inclined to doubt that the army had so many ambulances at the beginning of the march, and think that the very large number, six hundred, was reached toward the end when many miscellaneous light vehicles had been added to the ambulance train. The only division for which accurate figures are available had not nearly so large a quota of ambulances.

A thing especially notable in the medical arrangements of this march is that the preparation fitted the case with remarkable accuracy. Flies instead of tents, hospital wagon train cut in two, ambulance train largely increased, supplies carried on excess ambulances, light vehicles impressed as needed, food for the hospitals secured by foraging; all these things bespeak a versatile medical staff, that could adapt itself to circumstances, and would have succeeded under any conditions, if success were humanly possible. We must not forget that it was an army of picked men, picked by the most impartial of all inspectors, Darwin's law.

The mental influence, the morale, must also not be overlooked. In no other campaign of the war did it play such an important part in contributing to the success of the Union Army. Surgeon Moore in giving reasons for the health of the command, in a later report, does not, in the all too common manner, claim everything for the effects of his own measures, but says: "The pure air, freedom from drunkenness and other vices inseparable from garrison life, but most of all the novelty and excitement of an active campaign, on which every man knows that important results depend, are among the causes of better health in the field.

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And again, the variety and abundance of food, and possibly the irregular and predatory method of obtaining it, may have something to do with better sanitary conditions; and finally, but not least important, was that they were led by a general in whom they have unlimited confidence.

The thousands that dropped from the ranks during McCellan's retreat through the swamps of the Chickahominy had no counterpart in the swamps of the Carolinas. Not even wading swamps by day and lying in the mud by night could down these iron veterans. If as Napoleon said, the moral is to the physical as three to one, we have here an underlying cause for the freedom from disease of this army.

LOUIS C. DUNCAN, *Capt. M. C.*

MEDICAL OFFICERS OF GENERAL SHERMAN'S ARMY ON THE CAMPAIGN FROM ATLANTA TO SAVANNAH.

Medical Director of the Army:
Surgeon John Moore, U. S. Army.
Medical Inspector:
Surgeon E. D. Kittoe, U. S. Army.
Medical Director, Right Wing:
Asst. Surgeon David L. Huntington, U. S. Army.
M. D. 15th Corps:
Surgeon Robert Niccolls, U. S. Vols.
M. D. 17th Corps:
Surgeon J. H. Boucher, U. S. Vols.
Medical Director Left Wing:
M. D. 14th Corps:
Surgeon W. C. Daniels, U. S. Vols.
M. D. 20th Corps:
Surgeon Henry Q. Gill, U. S. Army.
M. D. Cavalry Division:
Surgeon B. Taylor Wise, U. S. Vols.

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MODERN METHODS OF QUARANTINE AGAINST ASIATIC CHOLERA.*

By Passed Assistant Surgeon ALLAN J. McLAUGHLIN, Public Health and Marine-Hospital Service.

UNDER Section 2 of the quarantine act of 1893, the President is authorized to detail a medical officer to serve in the United States Consulate at any foreign port for the purpose of enforcing the United States quarantine regulations and granting of Bills of Health.

The law further states that any vessel clearing and sailing from any such port without such bill of health and entering an American port, is liable to a fine not to exceed $5,000 for which the ship may be held, the fine being a lien on the ship.

In times of cholera danger, under this law medical officers of the Public Health and Marine-Hospital Service are stationed in cholera infected ports, or in ports from which emigrants from infected districts embark for America.

They enforce the United States regulations providing for detention for five days' observation in barracks, elimination of food stuffs from baggage and disinfection of their effects.

During the voyage the ship doctor is required to keep close watch over his passengers, to promptly isolate the sick and to report faithfully all sickness in detail upon arrival. On arrival in an American port, the ship is subject again to quarantine inspection and detention for five days to determine the presence of cholera. After the quarantine examination the immigrant before discharge, is examined under the immigration laws for disease or defect which would be likely to make him a public charge or a menace to the public. For many years these measures furnished protection against the introduction of Asiatic cholera and were considered ample until the demonstration of the role played by the bacillus carrier in the spread of Asiatic cholera.

*Read by Surgeon C. P. Wertenbaker, U. S. P. H. & M.-H. S., and discussed at the 20th Annual Meeting.

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Bacillus carriers were known for years before their significance in the spread of Asiatic cholera was appreciated. They were regarded by many as interesting phenomena comparatively rare and of slight importance in transmitting the disease.

In regard to the significance of the carrier in transmitting the disease, I give the following experience with cholera in Bilibid Prison.

Bilibid Prison is one of the finest institutions of its kind in the world. From the standpoint of discipline and control of its inmates it stands almost unrivalled. There is absolute control of the food and water supply, and ordinarily no fresh milk is used in the institution. The appearance of cholera in such an institution seemed inexplicable.

Each year, however, when Manila and the surrounding provinces were cholera infected, outbreaks occurred in Bilibid Prison.

The year 1908 was no exception. When the writer took charge of the Bureau of Health in August, 1908, cholera was present in Manila and epidemic in the surrounding provinces. In September the disease assumed epidemic proportions in Manila and broke out in Bilibid Prison. The precautions taken in Bilibid Prison were even more rigid than formerly in regard to water and food and the prohibition of vegetables, fruits, and fresh milk. Each incoming prisoner was placed in quarantine for five days and their stools were examined for intestinal parasites, but not for cholera.

Under these circumstances it occurred to the writer that the bacillus carrier afforded the only logical explanation, and orders were issued to examine the stools of the prisoners concerned in the preparation of handling of food and water. Owing to the pressure of work incident to the epidemic it was deemed impracticable to examine the stools of over 3,000 prisoners. The results were as follows:

Bilibid Prison.

Number of healthy persons examined	264
Number of persons carrying cholera vibrios	17
Percentage of bacillus carriers among healthy individuals	6.44

The outbreak was quickly suppressed in Bilibid Prison follow-

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ing an order to compel thorough disinfection of the hands under guard upon leaving the latrines and before eating.

Continuance of the hand washing, and examination of stools of incoming prisoners has eliminated the danger from the carrier and Bilibid Prison has had no cholera outbreak since 1908.

When one considers that immigrants are inspected before departure from Europe, carefully watched during the voyage, and again undergo a double inspection upon arrival in American ports, the chance of a frank cholera case escaping detection is infinitesimally small. Unfortunately we have cholera carriers to contend with, persons who show no external symptoms of cholera, and who would be able to evade the most rigid inspection. The cholera bacillus carrier is an individual carrying cholera vibrios in his intestine and yet who exhibits no signs of the disease.

The writer has never known a bacillus carrier to harbor cholera vibrios for longer than twenty days and the great majority lose their vibrios in less than ten days. However, many observers have found them present for longer periods, although all agree that the long-time carrier is the exception and not the rule. The following are the longest cited by Pfeiffer: (1)*

Persistence of cholera vibrios in stools of convalescents, or bacillus carriers.

Name of observer.	Longest duration.	Name of observer.	Longest duration.
	Days		Days.
Guttman	10	Kolle	48
Lazarus and Pulicke	12	Donitz	49
Michailow	12	Abel and Clausen	15
Simonds	18	Pfeiffer	13
Rumpel	24	*(2) Burgers	69
Rommelaere	47		

During the time of an epidemic, bacillus carriers are numerous and the writer found 6 to 8 per cent of carriers among healthy individuals living in the infected neighborhoods in Manila. When

(1)* Klinische Jahrbuch, 1908, Vol. XIX, Page 483.

(2)* Hygienische Rundschau, February, 1910, Vol. XX, No. 4.

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cases are few, the so-called sporadic cases, hundreds and even thousands of stools may be examined before the first carrier is found. The fact that the bacillus carrier may harbor the cholera vibrios as long as sixty-nine days illustrates how quarantines may be passed and an apparently inexplicable outbreak be explained. The danger from the bacillus carrier depends upon his habits and the sanitary conditions of the community in which he finds himself.

If he deposits his stools in a modern flush closet in a city in which disposal of human excrement is properly effected and if he washes his hands frequently enough and at the proper time, he is harmless. His urine contains no vibrios. He may find himself, however, in a community with no proper system of disposal of excreta, or in spite of the existence of such system he may deposit his stool where flies and other insects have access thereto, or deposit it in a place from which a well or other source of water supply becomes infected. He may fail to wash his hands after defecation and with his dirty fingers infect the food or drink of others.

Gaffky at the extraordinary session of the Permanent Committee of the International Sanitary Bureau held at Paris, March, 1911, reported a case in Germany who, after six months of observation, still passed vibrios in his stools. This suggests that such chronic carriers may have infection of the gall bladder and biliary passages. In fact Zirolia (4)* reports that in two cases vibrios reappeared in the stools after negative periods of 20 days and one month, respectively. Such intermittency is scarcely possible without infection of the biliary apparatus. Zirolia observed further that after a saline purgative vibrios reappeared in a case which had been negative for three weeks. Kulescha (5)* found that the cholera vibrio could be detected in the gall bladder in 10% of the cases producing some lesions and propagating in the biliary passages.

Kulescha also reports a case of cholera, sick Nov., 1908, who recovered and was discharged from the hospital in January, 1909, after having had vibrios continuously in his stools for 57 days.

(4)* Igiene Moderna, Vol. III, No. 10, 1910.
(5)* Klinische Jahrbuch, Vol. XXIV, No. 1.

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He re-entered the hospital in October, 1909, with hepatic trouble and died October 24th, 1909; after autopsy cholera vibrios were found in the biliary passages. It is, of course, impossible to exclude the possibility of a reinfection, but Kulescha believes that the vibrios persisted from the time of his cholera illness in November, 1908.

These long time carriers with intermittent shedding of cholera vibrios could pass quarantine even after a stool's examination, during the negative period, but such a combination of conditions must be rare, and the use of a saline cathartic and enriching media make it extremely improbable that carriers would evade the examination.

The time of observation in foreign ports, the time of transit and whatever quarantine detention may be imposed upon arrival avail much in excluding the frank cases, but are ineffective measures against the bacillus carrier. In view of these facts, the Surgeon General of the Public Health and Marine-Hospital Service deemed it advisable to add an additional safeguard by imposing a bacteriologic examination of the stools of all steerage passengers from infected ports and places.

This regulation was promulgated by the Secretary of the Treasury July 19, 1911.* The writer was sent to Boston and Providence to see the new regulation put into effect. The local health authorities, both at Boston and Providence, were in hearty accord with the regulation, and the following procedure was put into operation:

In considering the problem of a stools examination on a large scale, two factors must be given their proper weight.

No. 1. Proper protection of the public.

No. 2. Minimum restriction of commerce consistent with No. 1.

If we could take unlimited time in the matter we would use every procedure known for the detection of the cholera vibrio, and would probably detain the ships in quarantine many days or

*These measures were carried out not only at the National Quarantine Stations, but at New York, Boston and Providence. New York has a state quarantine and Boston and Providence are municipal quarantines. By law all state and municipal quarantines must conform to the minimum requirements of the Federal regulations. Consequently, when the new regulation was promulgated, it became the duty of the Surgeon General of the Public Health and Marine-Hospital Service to see that the regulation was properly put into effect. Officers were accordingly sent to New York, Boston, and Providence for this duty.

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for weeks, but as quarantine officers, regardless of our personal views on the immigration problem, we are charged by law with carrying out the quarantine regulations, and especially instructed to carry them out with the minimum restriction of commerce. This necessitates the elimination of hanging drop or other slow technical procedures, cholera red reactions, use of gelatine media and many other tests which are interesting and highly scientific, but not necessary for cholera diagnosis and only serve to complicate and increase the time of the examination.

SECURING THE SPECIMEN.

The specimen is best secured by the administration of a saline and magnesium sulphate serves very well. It is best administered on an empty stomach about 6:00 a. m. Passengers with diarrhoea, and children may be exempted, and a good specimen may be obtained from these by passing a large catheter or rectal tube with several "eyes" cut in the upper end. In withdrawing the tube the "eye" scrapes mucous off the lining of the bowel and furnishes a very good specimen. The use of swabs is not recommended as a good specimen is difficult to obtain if the patient is constipated. The swab has a great deal of the material scraped off by the tight sphincters and further may cause considerable pain and injury, especially when hemorrhoids are present. Doctor Serrati, the Italian Royal Commissioner, at New York, suggested that the swabs be sheathed in glass tubes. The tube protects the swab in passing the sphincters and is also less painful in passing. The only objection raised against the salts are the danger of infection from the handling of so many stools, and the danger to the patient of administering a dose of salts. The first objection is not valid if the "handling" is properly done. In regard to the danger of giving a dose of salts, one case is cited at New York as having been a carrier, who after having calomel and salts, came down with cholera and died.

Many writers speak of "latency" in cholera, "long incubation periods," etc., these terms indicating that an individual, for instance, a bacillus carrier, already carrying the vibrios in his intestine, may by reason of some factor which damages his intestinal mucosa or lowers his power of resistance, suddenly be-

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come ill after carrying the organisms for days beyond the ordinary period of incubation (one to five days).

It is a very plausible theory, but lacks positive proof. I have seen cases which seemed to accord with this description, but was never able to exclude the possibility of infection from some unknown source (undiscovered bacillus carrier) within the ordinary incubation period. There is no evidence to show that the New York case had been a carrier, and none whatever to exclude the possibility that he had received his infection a few days previously from a carrier who remained undiscovered.

As a matter of fact salts were administered at Boston and Providence in about 2,000 cases without any ill effects. According to Zirolia, cited above, the administration of a saline purge made manifest cholera vibrios in the dejections of a convalescent after his stools had been negative for three weeks, which would indicate that the saline assists in the detection of carriers, especially if we have such a thing as intermittent carriers.

DISPOSAL OF THE STOOLS AFTER PLANTING.

The specimen should be passed in a paper sanitary cuspidor or similar receptacle, which is cheap and may be burned. After making the plants the stool and container is dropped in a flour barrel. When the barrel is full or the samples all taken the cover is placed and the barrel with its contents burned.

The specimens are planted in peptone by means of sterile pieces of wood (an ordinary wooden tongue depressor split in three, serves very well). This obviates the necessity of sterilizing a platinum loop or other metal instrument and saves much time. After planting, the stick is destroyed with the specimen in the barrel.

PLANTING AND RECORDING THE SPECIMENS.

The immigrants are divided into groups of 150 to 200, each group designated by different colored tags. The plants are made on a table convenient to the latrines. The specimens are brought to the bacteriologists at the tables by the male immigrants themselves under the supervision of orderlies or male nurses. The specimens from the women and children are taken by trained fe-

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male nurses and brought to the tables. At each table there is, besides the bacteriologist, a clerk, who records the name of the immigrant in a book and gives him a number in consecutive order. This number goes on the immigrant's colored tag and also on the peptone tube which has been inoculated. The amount of material for each peptone tube should be about equal to two or three large loops. After inoculation the tubes should not be agitated and agitation should be avoided until the smears are made after incubation.

INCUBATION.

The best temperature for incubation is from 35 to 37 Deg. C., and the tubes should be incubated about six hours. If it is not possible to examine before eight hours, second peptone sub-cultures should be made.

MAKING SMEARS AND STAINING.

To make a satisfactory smear from a peptone culture is not easy. Four or five large loops from the surface (but avoiding the pellicle) are placed in the center of a clean slide, and without much spreading dried slowly, and fixed by heat. This gives more concentration and more organisms in a field than if one drop was spread upon a slide.

The stain should be carbol fuchsin diluted by the addition of nine parts of water. Stain about one minute, wash carefully and examine. In Boston the numbers were cut on the slides with a diamond, numbering the slides consecutively, in lots of 50, as the peptone cultures came in racks of 50. The slides corresponding to the numbers on the tubes were selected and used.

EXAMINATION OF THE SMEARS.

This is the most important step in the technique. If carelessly done, the whole examination is valueless. If properly done, 80 to 90% of the specimens may be rejected without plating. The observer must search, using a mechanical stage, from 25 to 50 fields, and if he finds no suspicious curved organisms, the speci-

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men is marked negative. If he finds curved organisms, a subculture in peptone and plates are made. To be able to do this requires acute vision, and a knowledge of vibrios and other curved forms. The observer at first finds curved organisms in nearly every specimen. But after plating these out he finds that many are not vibrios at all. At first the beginner will plate out about four-fifths of his specimens. After training and the experience gained by studying his plates, he will not find it necessary to plate more than 10%. The differentiation of what seem to be curved organisms and vibrios can only be learned by actual experience, and safety at first lies in plating all the doubtful ones. At Boston the bacteriologists had about two weeks' steady training before the first large vessel arrived. There had been a case of cholera in Boston about the time the training started and the men had the advantage of working with a freshly isolated culture for practice.

PLATES.

The plates should be ordinary nutrient agar (3%) neutral to phenolpthalein. The surface dried by an hour in the thermostat, at 37, or one may use plates more than 24 hours' old. The plates should be examined after about 16 hours.

The colonies which have the characteristics of the cholera colonies may be fished direct to drops of 1/200 specific cholera serum on a clean glass slide, carefully marking the colony on the plate. Or a smear may be made from the colony, stained and examined. In any event the colony, if a vibrio, must be fished to an agar slant grown 18 hours and a quantitative agglutination made, using a serum of at least 1 to 4,000 in dilutions ranging from 1-50 to 1 to 1,000. Dilution one to 1,000 should be positive beyond question after one hour in the incubator at 37 Deg. C.; 1 to 200 should give an instantaneous agglutination. The agglutination test should be controlled by test with a known cholera vibrio, and with dilutions of normal serum and salt solution.

The rapid test on the slide with an instantaneous reaction in a dilution of 1 to 200 may be completed by drying, fixing and staining the clumps *in situ*. Under a low power the clumps will show very well and the higher power lenses will show the characteristic morphology.

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Working with this method 10 bacteriologists under the writer's supervision, examined 1,000 specimens in a single day and the complete examination of 1,200 stools was concluded within 48 hours.

The immigrants from infected districts had been examined bacteriologically before leaving Italy so that the chances of finding carriers were small. Quite a number of vibrios were isolated, but none agglutinated with cholera serum, although some were morphologically indistinguishable from true cholera vibrios.

The immigrants on Gallops Island, separated in groups of 150 to 200 persons, were kept segregated by Boston police, and no contact allowed between the groups. If a carrier had been found the segregation into groups would have obviated the necessity of doing the entire examination over again. The groups to which the carrier belonged would have been detained and reexamined, but the other groups would have been discharged.

After bacteriologic examination steerage passengers may be discharged in 48 hours with greater safety than after 5 days of detention and observation only.

No bacteriological procedure can afford absolute protection if we have to deal with intermittent and long-time carriers.

The method used gives a large measure of protection, much greater than mere detention and observation, and the additional safeguard is furnished with the minimum restriction of commerce.

DISCUSSION.

Lieut. Colonel W. B. Banister, U. S. A., asked if Bilibid Prison is screened, otherwise infection might easily be carried into the prison from Filipino shacks in the near vicinity.

Surgeon General A. W. May, Royal Navy, Great Britain: "What is an infected port." He cited an instance when his ship was subjected to fifteen days' quarantine because they had come from an infected port four thousand miles away; they had no cases of the plague aboard. "Do you use any latitude with people who come to your country?" "Is this examination applied to immigrants or to all?" "I am anxious to know these two points."

Surgeon Wertenbaker: "I can answer the last question. As a general rule it is applied only to immigrants. If the first and second class passengers are liable to be infected we also make the examination for them.

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It is thought, as a rule, that the immigrant is most liable to infection. We can only get the highest possible efficiency with the minimum amount of restriction to commerce. An infected port is where there is one or more cases of a quarantinable disease as specified by the United States. If there is a certificate given by the officer of the service who is stationed in the office of the consul in that port that there is cholera there, one case or many, it is considered an infected port. We wait until a sufficient length of time elapses and no other cases appear. We receive reports from officers, consuls, ambassadors and ministers. If there is a case of cholera in any port of the world it is cabled to this country."

Surgeon General May: "Do you have competent observers to give a free bill of health?"

Surgeon Wertenbaker: "In infected ports we do have competent observers. In other ports we have ordinary consuls."

Captain Henry D. Thomason, U. S. A.: "I have personal interest in infected ports. I speak feelingly on that subject because in Cuba we had trouble with the Marine-Hospital Service in the United States. Yellow fever was present in the province of Santiago. We only had one case a month and all that time the quarantine authorities in the United States insisted on quarantining the port of Havana, which was a long way off. The passengers of Havana were held up five days. You would have to buy tickets five days before sailing and be placed in quarantine. We said some pretty hard things. Was Havana an infected port at that time? It was in winter time and there were no mosquitoes."

Surgeon Wertenbaker: "I have heard that story before. I was not in the Surgeon General's Office and am not familiar with the details. It would be impossible to say what an infected port is. This has to be settled in the Surgeon General's Office. There are many things to be considered. Far better that the passengers coming from the port of Havana should be subjected to inconvenience rather than have a case of yellow fever in the United States. It is not only necessary that the quarantine authorities should take precautions against yellow fever, but also against a panic of fear of it, which is sometimes just as bad. I can't go into details, but the men who were in the office of the Surgeon General of the Marine-Hospital Service thought they had definite reasons. It was, I think, best to be on the safe side. I have seen an outbreak of yellow fever and hope I will never see another. It would be better to wipe out the Island than to have a yellow fever outbreak in the United States."

Captain Thomason: "An outbreak here is impossible."

Surgeon Wertenbaker: "The trouble was you were not the one to decide it."

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REPORT OF THE BOARD FOR THE STUDY OF TROPICAL DISEASES AS THEY EXIST IN THE PHILIPPINE ISLANDS. QUARTER ENDING DECEMBER 31ST, 1911.*

By Major WESTON P. CHAMBERLAIN, Medical Corps, U. S. Army, and Captain EDWARD B. VEDDER, Medical Corps, U. S. Army.

THE Board for the Study of Tropical Diseases as they Exist in the Philippine Islands has the honor to submit the following report of its work for the quarter ending December 31st, 1911.

Captain John R. Barber, who had been a member of the Board since February 15, 1911, left the Division December 10, 1911. Lieutenant Ernest R. Gentry has been detailed to fill this vacancy but has not yet arrived in the Philippine Islands.

The Relative Resistence of Blonds and Brunettes to the Harmful Influences of a Tropical Climate.

During the last two years the Board has been collecting data bearing on the influence of the tropical climate on blonds and brunettes.† The work has been completed during the present quarter and the results will shortly be published in full in the Philippine Journal of Science.[7] The bulk of the observations were carried out on enlisted men of the Army, but a collection of statistics was made from a group of men consisting of 568 officers of the Philippine Scouts, Philippine Constabulary and Manila police force. This body of men will be referred to as the S-C-P-GROUP. Its members had an average of 5.5 years of continuous tropical service.

The evidence on which the report is based was of several kinds and will be considered under 6 subheads.

*Report made to the Surgeon General, U. S. Army.

†Throughout this report the blond group includes men with blue or grey eyes, light brown, red, flaxen or sandy hair, and fair, ruddy or light complexion, while the brunette group is made up of those with brown or black eyes, dark brown or black hair and medium or dark complexion. Men in whom one of the complexion factors correspond to a certain type and the other two belonged to the opposite type were classed as mixed and were excluded from the observations considered in Subhead I. With this classification there will be a well marked average difference in complexion type between the blond group and the brunette group.

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1. *Exact Observations on Blonds and Brunettes.* These observations were carried out at various posts in the islands on 500 blonds and an equal number of brunettes. Except for the work on the white blood cells, all of the examinations considered in this subhead were made by medical officers detailed by the Division Commander for the purpose.* The soldiers were under observation for one year, during which time quarterly tests were made on the weight, temperature, pulse, respiration, blood-pressure, and muscular strength. Examinations were made at the beginning and end of the year on the erythrocytes, the hæmoglobin and the urine, and also on the weight, pulse, blood-pressure, temperature and respiration immediately after exercise. At the end of the period of one year the differential and Arneth counts of the leucocytes were studied and the stools were examined for intestinal parasites. The entire work included many thousands of observations. The conclusion was reached that the differences between the exact observations on the blonds and on the brunettes were so slight and so inconstant that they were of no significance. The tests failed to show any anatomical or physiological distinctions for the two complexion types in large groups of men who, at the end of the year of observation, had been continuously exposed to the Philippine climate for an average of 20 months.

2. *Relative Amounts of Sickness among Blonds and Brunettes.* The sick records during a period of 24 months for 504 blonds and 500 brunettes in the Army showed an amount of illness greater among the blonds by about 10 per cent. However, in the S-C-P-GROUP, with an average of 5.5 years of tropical service, the conditions were reversed and the incidence of sickness was 20 per cent higher among the brunettes than among the blonds. Also the proportion of men in the S-C-P-GROUP who had never been sick was higher for the blonds than for the brunettes. Of 21 medical officers who observed the blond and brunette soldiers, only one considered that there was any difference in the ability of the blonds and brunettes to resist the tropical climate.

3. *Symptomatology and Dietetic Habits of Blonds and Brunettes.* A series of questions were asked of the 1,000 soldiers and the 568 members of the S-C-P-GROUP. These queries had to do with their dietary habits and with the symptoms which are attributed to tropical residence; also there were inquiries as to whether they enjoyed tropical service, whether they felt as well in the Tropics, and whether they suffered from exposure to direct sunlight. In the case of the soldier group the differences between the two complexion types were so slight as to be inconclusive. In the case of the S-C-P-GROUP the blonds seemed to be at some disadvantage, but the mixed types of complexion were affected much more

*The officers who did the work referred to in this subhead were the following: Majors A. E. Truby, Roger Brooke, Jr., and C. C. Collins, Captains H. M. Snyder, E. G. Bingham, John R. Barber, Mahlon Ashford, E. G. Huber, C. D. Cowles, Jr., G. L. McKinney, W. L. Hart and H. A. Phillips, 1st Lieutenants J. B. H. Waring, W. R. Dear, C. E. Doerr, F. S. Wright, C. G. Snow, N. L. McDiarmid, Armin Mueller, T. J. Leary, M. C. Stayer, L. C. Garcia and C. E. Fronk, Medical Corps, and 1st Lieutenants W. F. deNiedman and C. A. Betts, Medical Reserve Corps.

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markedly than were the blonds. Probably chance accounted for the differences.

4. *Relative Proportion of Blonds and Brunettes Invalided Home, and Existing in the S-C-P-GROUP.* To determine the relative proportions of blonds and brunettes among the troops serving in the Philippines, we examined 10,072 soldiers and found that for each 100 blonds there were 86 brunettes and 233 of the mixed type. During a period of 18 months we looked over all soldiers who were invalided home, and it was found that among these there were, for each 100 blonds, 126 brunettes. In other words the rate of invaliding home was very much greater among the brunettes than it was among the blonds.

The S-C-P-GROUP was made up, for the most part, of former enlisted men of the Army, among whom the ratio of the two complexion types was probably about the same as in the 10,072 soldiers whom we classified. The members of the S-C-P-GROUP had served in the Philippines for periods ranging from 2 to 13 years, the average length of time being 5.5 years. If the climate is more harmful to the blonds than to the brunettes we would expect that the ranks of the blonds would be depleted by resignation, death and invaliding home. Such was not found to be the case. For each 100 blonds in the S-C-P-GROUP there were only 79 brunettes, whereas among the 10,072 soldiers there had been 86 brunettes.

The evidence adduced in this subhead shows that the ratio of invaliding home is lower for the blonds than for the brunettes, while in the S-C-P-GROUP the number of blonds is probably a little higher than it was in the class from which the S-C-P-GROUP originated. These are strong arguments in favor of the assumption that the blonds are quite as well able as the brunettes to resist the tropical conditions met with in the Philippines at the present time.

5. *Character and Behavior of Blonds and Brunettes.* Some figures have been quoted by Woodruff to support a theory that the irritation produced by an excessive amount of sunlight affects the conduct unfavorably and increases the prevalence of crime. If such is the case it is conceivable that misdemeanors would be more frequent among the blonds than among the brunettes. To investigate this point we studied the character, change in character, court-martial trials, fines, confinements, habits as to alcohol and days lost for venereal disease among 350 blonds and an equal number of brunettes. The conclusion was reached that there was no appreciable difference in behavior between blonds and brunettes except in regards to stimulants, the excessive use of alcohol being perhaps a trifle more common among the blonds. However, too much stress should not be laid on this last point in view of the small number of persons in the groups who indulged to excess.

6. *Relative Frequency of Insolation among Blonds and Brunettes.* The theory has been advanced that insolation is due to the action of the actinic rays of the sun upon the head. If this be so it is conceivable that the

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effects might be more evident among individuals of the fair type. We desired to learn the relative frequency of sunstroke and heat exhaustion among the different complexion types, but insolation is so rare in the Philippines that no statistics could be gathered here. Therefore we applied to the authorities of hospitals in the large cities of the United States and received reports of 375 cases of insolation. The proportion of blonds affected was not quite so large as was the proportion of the same type among 10,072 American soldiers who were classified according to complexion. We do not know, of course, whether the distribution of complexion types which obtained in the populations of the cities concerned was the same as among the 10,072 soldiers examined, but we do not believe that there was any decided difference, since our Army is recruited to a large extent from urban sources. From the evidence available it was concluded that the incidence of insolation was no greater among the blonds than among the brunettes.

Climatic Influences. After a study of the influences of the tropical climate it does not seem to us by any means proved that the actinic rays of the sun are factors in tropical morbidity or that pigmentation of the skin is a protective effort on the part of nature against the chemical rays of the solar spectrum. It appears that the main causes of the troubles encountered in the Tropics are infections, continuous heat, and high humidity. Subsidiary causes are nostalgia, isolation, monotony and the excessive use of alcohol resulting therefrom. Amelioration of these subsidiary conditions and sanitary improvements directed against the infections prevailing in the Tropics have enormously reduced the morbidity and mortality in the Philippines, in Panama, in Cuba, and elsewhere in hot countries. Affections of the nervous system, including neurasthenia and insanity, are among the diseases considered by Woodruff to be particularly liable to occur in the Tropics as a result of excessive light stimulation. He based his opinion on figures gathered in 1901 and 1902. Subsequent statistics do not confirm the view that nervous diseases are prevalent in the Philippines. The reports of the Surgeon General of the Army for the years 1903 to 1909, inclusive, show that insanity and nervous diseases have been no more common among the soldiers in the Philippines than among those in the United States. For the last 5 years, 1904 to 1909, there has been no material difference between the suicide rate in the Philippines and that in the United States. Neurasthenia has played but a small

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part in the morbidity of the Islands during these years. Yet the sunlight is the same as in the period from 1898 to 1902, and no special effort is made to protect the men from the sun, but the hardships, the bad sanitation, the poor food, the isolation and the nostalgia of the earlier days have been largely remedied.

General Summary. It is well known that heat and humidity in an experimental chamber, and in the absence of light, can produce symptoms similar to those occurring in milder degree among residents of the Tropics. We think it probable that these two factors, combined with infections, nostalgia and monotony, account for most if not all of the injurious effects seen in tropical lands. To explain the conditions met with in the Philippines there seems to be no need for invoking the aid of the actinic rays of the solar spectrum. Protection against these rays by orange-red clothing was found to be of no benefit.[1] It is by no means proved that pigmentation *per se* is beneficial in the Tropics. In our investigations of blonds and brunettes the evidence was conflicting, some facts being in favor of the fair and others in favor of the dark complexioned men. This is what would be expected if there were actually no difference between the two types as regards their resistence to tropical influences. From a consideration of all the data it appears that blonds are quite as well able as brunettes to withstand the influences of the Philippine climate for a period of two years and probably for a period of five and one-half years. In case of residence beyond the latter period we are not in a position to express an opinion based on any extensive personal observation.

THE ERYTHROCYTE COUNT AND HAEMOGLOBIN READING FOR HEALTHY WHITE SOLDIERS LIVING IN THE PHILIPPINES.

More recent investigations have shown that most of the conditions formerly diagnosed as "tropical anæmias" are in reality instances of secondary anæmias due to infection with parasites, notably uncinaria and plasmodia. The pallor seen in many persons living in the Tropics is due usually to a superficial ischæmia, and red counts and hæmoglobin estimations in such cases showing no impoverishment of the blood. The blood data collected

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during the observations on the blonds and brunettes have been analyzed in a special article which will soon appear in the *Philippine Journal of Science.* (5) There were 1,418 erythrocyte counts, and an equal number of hæmoglobin estimations, made on the blood of 702 soldiers. The average red count was 5,200,000 and the average hæmoglobin 89.6 per cent. The color index at different periods ranged from 0.82 to 0.88, averaging 0.86. In view of the more recent standards established for the erythrocyte count of healthy young men in the temperate zone, it cannot be considered that the red cell count of 5,200,000 is above normal limits. The hæmoglobin readings and the color index are perhaps a trifle below what is to be expected for the same class of men in Europe and America, but the reduction is very slight and not sufficient to be considered evidence of a definite anæmia. The average length of tropical residence in our series at the date of our last examinations was about 20 months.

THE BLOOD-PRESSURE AND PULSE RATE IN THE TROPICS.

From the examinations made during the blond-brunette observations and the orange-red underwear tests, and from the work the Board has done on Filipinos there has been gathered together a great number of blood-pressure and pulse observations which have been analyzed and reported in a special article which will shortly be published in the *Philippine Journal of Science.* (4) There were 5,368 blood-pressure readings, made on 992 healthy white soldiers, and 552 observations on 386 healthy adult Filipinos. There were equal numbers of pulse counts made on the same individuals. On the basis of a 12.5 centimeter armlet, the average systolic pressure for Americans between 18 and 30 years of age was 115 millimeters, and for those between 30 and 40 years 118 millimeters. For Filipinos the average pressure was 116 millimeters for men ranging from 15 to 40 years of age and averaging 25 years. These figures are little if any below the standards for temperate climates, since according to the most recent work in Europe and America the mean pressure, *with a broad armlet,* is found to lie between 115 and 120 millimeters for healthy males between 15 and 30 years of age.

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Usually the lowest readings for American soldiers were obtained in the first 3 months of Philippine residence, but there was no progressive tendency for the pressure average to rise or to fall with increased length of Philippine service. The pressure was a trifle lower (2 or 3 mm.) during the hottest part of the year. Neither the type of complexion nor the use of orange-red underwear exerted any appreciable influence on the blood-pressure. The size of the men did not affect the average readings. Exercise raised the tension as was to be expected. For both Americans and Filipinos there was a progressive increase of blood-pressure with advancing years. The pulse rate for both races averaged a few beats above the usual standard of 72 *per* minute.

INFLUENCE OF TROPICAL RESIDENCE ON THE WEIGHT.

In connection with the work which the Board has been doing during the last 3 years, a large number of weight statistics have been collected which, on analysis, show some points of interest. In the series observed in 1909, four observations were made spaced over a period of 10 months, while in the 1910-1911-GROUP, five observations were made at quarterly intervals throughout an entire year. The men under consideration were all healthy soldiers doing regular garrison duty. Their average ages and lengths of tropical service, and the result of weight observations are shown in TABLES I and II.

TABLE I.—*Average weight during* 10 *months for* 564 *soldiers serving in the Philippines, arranged by quarterly periods;* 1909-GROUP.

Average Age	Average Height	Average Weight in Pounds				Loss During 10 Months		Average Tropical Service at End of Observation Period
Years	Inches	March 1909	June 1909	Sept. 1909	Dec. 1909	Lbs.	Percent	
25.5	67.3	142.5	140.7	140.8	140.6	1.9	1.33	27 Months

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TABLE II.—*Average weight during one year for* 608 *soldiers serving in the Philippines, arranged by quarterly periods;* 1910-1911-GROUP.

Average Age	Average Height	Average Weight in Pounds					Loss During Year		Average Tropical Service at End of Year of Observation
Years	Inches	1910 Second Quarter	1910 Third Quarter	1910 Fourth Quarter	1911 First Quarter	1911 Second Quarter	Lbs.	Perc'nt	
27.4	67.5	148.3	147.8	147.5	147.3	146.3	2.0	1.34	19 Months

On examining the tables it will be seen that in both groups there was a loss of weight, amounting to 1.9 pounds during the 10 months in the 1909-GROUP and 2.0 pounds during the year in the 1910-1911-GROUP. The percentage of loss, based on original weight, was the same for each group, 1.3 per cent. To determine if the large men lost weight in any different degree than the small men the cards for both groups were combined and arranged in sub-groups according to the height of the men in inches. The results for the first and last weight observations are shown in TABLE III.

TABLE III.—*Average weights of soldiers serving in the Philippines, arranged according to size of men. The length of time between the first and last observation was* 12 *months for over half of the men and* 10 *months for the remainder.*

Height Inches	Number of Men	Average Weight in Pounds		Average Loss of Weight		Average Tropical Service at End of Observation Period
		At beginning of period	At end of period	Pounds	Percent	
Under 64	27	132.9	131.2	1.7	1.28	19.4 months
64	114	134.7	132.7	2.0	1.48	23.1 months
65	157	139.9	137.5	2.4	1.72	21.9 months
66	187	141.9	140.5	1.4	0.99	23.2 months
67	225	144.4	142.3	2.1	1.45	22.8 months
68	251	147.2	146.0	1.2	0.81	23.8 months
69	127	152.7	150.0	2.7	1.77	22.1 months
70	80	155.6	154.7	0.9	0.57	22.0 months
71	40	159.0	158.0	1.0	0.63	21.2 months
72 or over	35	164.5	161.3	3.2	1.94	23.6 months

It will be seen in TABLE III that with the increase in height there was the progressive rise in weight which was to be ex-

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pected. Therefore, each sub-group according to height represents a class of men who were larger than those in the preceding sub-group. There was no material difference in the length of tropical service for the different sub-groups. On examining the column showing percentage of weight lost it is obvious that there was no progressive change either upwards or downwards. *In other words the percentage of weight lost during the observation period was not affected by the size of the man.* There is an observation of some interest in connection with the statement frequently made that small men are better fitted than large ones for tropical service. (2) (6)

In the case of 200 men who had arrived in the Philippines very shortly before the first observation was taken, the average loss of weight for a year was 3.2 pounds, or 2.3 per cent of the original weight. This is a greater loss than is shown in TABLES I and II where the period of tropical service preceding the first observation averaged in one case 7 months and in the other 14 months. It suggests that the loss of weight among soldiers in the Tropics may be more marked in the first year of service than at a later date. The figures for these 200 men are shown in TABLE IV.

TABLE IV.—*Average weight at beginning and end of a year for 200 American soldiers who, at date of first observation, had just arrived in the Philippines.*

Average Weight in Pounds		Loss For Year	
Jan. 1909	Dec. 1909	Pounds	Percent
140.1	136.9	3.2	2.27

In our work on the blonds and brunettes, referred to above, we showed that the loss of weight in the Philippines was not influenced by the complexion type. In a former report by Phalen, (1) of this Board, it was shown that men wearing orange-red underwear lost weight to a slightly greater degree than did those wearing white undergarments.

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INFLUENCE OF TROPICAL RESIDENCE ON THE BODY TEMPERATURE.

There have been many diverse expressions of opinion as to whether the temperature of healthy white men living in the Tropics is different from the accepted standards for temperate climates. The subject is quite fully discussed by Castellani and Chalmers in their Manual of Tropical Medicine. These observers agree with Plehn that the acclimatized European in the Tropics has the same temperature that is normal in Europe. They state, however, that the majority of the observers quoted by them "are inclined to the view that there is a slight increase in the temperature of Europeans and Natives in the Tropics as compared with the Temperate Zone temperatures."

During the work referred to in the preceding sections we have analyzed a large number of temperature readings on American soldiers in the Philippines. The observations were all taken under the tongue, and in the 1910-1911-GROUP the thermometer was kept in the mouth for 5 minutes to ensure registry of slight degrees of fever if present. The observations were made at various hours between 8 A. M. and 4 P. M. The results are shown in TABLES V. and VI.

TABLE V.—*Average mouth temperatures, at quarterly intervals during a year, for 579 American soldiers in the Philippines;* 1909-GROUP.

Average Age Years	Average temperatures in degrees Fahrenheit					Average tropical service at end of the year of observation
	January 1909	March 1909	June 1909	September 1909	December 1909	
25.5	99.0°	98.9°	98.8°	98.9°*	98.7°	27 months

TABLE VI.—*Average mouth temperatures, at quarterly intervals during a year, for 608 American soldiers in the Philippines;* 1910-1911-GROUP.

Average age, years	Average temperatures in degrees Fahrenheit					Average tropical service at end of the year of observation
	Second quarter 1910	Third quarter 1910	Fourth quarter 1910	First quarter 1911	Second quarter 1911	
27.4	98.8°	98.8°	98.8°	98.6°	98.7°	19 months

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In order to have a standard for comparison based on the temperature of American soldiers living in the cooler parts of the United States we obtained, through the assistance of Captain Mathew A. Reasoner, Medical Corps, a number of observations made on enlisted men stationed at Vancouver Barracks, near Portland, Oregon. The readings were taken by mouth and the thermometer kept in from 6 to 10 minutes. At 1 P. M., November 24th, with humidity 78 and temperature 50° F., the average for 25 healthy soldiers who had been at rest 2 hours was 98° F. On November 23, on a sunny forenoon, with humidity 80 and temperature 50° F., the temperature of 26 men averaged 98.7° F. before drill, and 98.8° F. immediately after an hour of drill. It will be seen that these latter figures are the same as those found in the Philippines in the 1910-1911-GROUP and but 0.1° or 0.2° F. lower than those in the 1909-GROUP.

The temperature readings in the 1909-GROUP were for the most part taken immediately after some exercise, as a march or drill, while such was not the case in the 1910-1911-GROUP. This doubtless accounts for the slightly higher figures in the former group. If we accept the range between 98° and 99° F. as representing the normal temperature excursion of man, when registered in the mouth, it will be seen that none of the averages for the different periods went beyond these limits. As compared with the generally recognized mean of 98.6° F., the tables show that at no time was this figure exceeded by more than 0.4° F., and at most periods the difference was 0.2° F. or less. As regards the individual men it was not unusual to find at some period a temperature as high as 100° F., but it is obvious that the occurrence of such cases was not sufficiently numerous to raise the average temperature materially above the recognized Temperate Zone standards.

In our work on the blonds and brunettes it was shown that the complexion type exercised no appreciable influence on the temperature. In our 1909-GROUP the mean annual temperature for 111 blonds was 98.9° F. and for 118 brunettes was 98.8° F. In the 1910-1911-GROUP the mean annual temperature was the same for both types, the observations having been made on 307 blonds and 301 brunettes.

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THE CAUSES OF MORBIDITY, OF MORTALITY AND OF INVALIDING, WHICH ARE AT PRESENT OPERATIVE AMONG WHITE TROOPS IN THE PHILIPPINES.

In connection with some work which the Board has been doing we had occasion to examine the white men who were invalided home from the Division, and also to investigate the amount of sickness occurring in a group of 1,000 American soldiers who had an average of two years of Philippine residence, the tropical service for the individuals ranging from a minimum of 14 months to a maximum of 12 years. The results are shown in Tables VII, VIII and IX. The sick record shown in Table VII covers an average period of about 24 months, but owing to the manner in which the data was collected it cannot be used as a basis for absolute admission rate, but only for a comparison of the frequency of admission from the different diseases enumerated in the column of diagnoses. Table IX shows the causes of mortality which were active during the period covered by the other two tables.

TABLE VII.—*Admissions to sick report and days lost from sickness during an average period of 2 years for 1,000 American soldiers serving in the Philippines.*

DIAGNOSES	Admissions	Per cent of total admissions	Days sick	Per cent of total days sick
Diarrhoea and dysentery	142	7.9	1,391	6.0
Dyspepsia, indigestion and gastritis	61	3.4	258	1.1
Constipation	46	2.6	145	0.6
Intestinal parasites	26	1.4	244	1.0
Coryza and bronchitis	37	2.1	234	1.0
Tonsilitis, pharyngitis and catarrh	30	1.7	375	1.6
Malarial and undetermined fevers	188	10.4	1,224	5.3
Dengue fever	95	5.3	645	2.8
Neuralgia, myalgia and herpes zoster	21	1.2	216	0.9
Rheumatism, articular, acute and chronic	16	0.9	349	1.5
Tuberculosis	8	0.4	144	0.6
Ring-worm	35	1.9	314	1.3
Pemphigus, eczema, dermatitis and ulcers	38	2.1	276	1.2
Furunculosis, carbuncle, cellulitis & abscess	111	6.2	833	3.5
Lymphadenitis, non-venereal	27	1.5	520	2.2
Appendicitis	8	0.4	137	0.5
Heat exhaustion	12	0.7	58	0.2
Diseases of eye and ear	30	1.7	644	2.8
Neurasthenia	3	0.2	71	0.3
Minor surgical conditions	82	4.6	1,135	4.9
Miscellaneous diseases*	69	3.8	801	3.4
Accidental	250	13.8	2,577	11.1
Alcoholism and sequelæ	24	1.3	93	0.4
Venereal diseases	441	24.5	10,624	45.6
Total	1,800	----	23,308	----

*In this and the two following tables "miscellaneous diseases" includes no conditions which could in any way be considered of tropical origin.

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TABLE VIII.—*Causes leading to the invaliding home of American soldiers in the Philippines during* 18 *months, July,* 1910, *to November,* 1911. *The mean strength of the command during the time was approximately* 11,600.

Diagnoses	Number	Percent of Total Invalided
Neurasthenia	19	6.1
Other nervous diseases	26	8.3
Mental diseases	46	14.7
Chronic dysentery, diarrhoea and enteritis	21	6.7
Sprue	3	1.0
Other intestinal diseases	1	0.3
Blood and circulatory diseases	15	4.8
Tuberculosis	81	25.9
Malaria and sequelæ	4	1.3
Gout and rheumatism	9	2.9
Renal diseases	6	1.9
Pulmonary diseases except tuberculosis	7	2.2
Diseases of special senses	12	3.8
Sunstroke	1	0.3
Venereal disease	15	4.8
Chronic alcoholism	5	1.6
Miscellaneous	18	5.8
Wounds and injuries	24	7.7
Total	313	----

TABLE IX.—*Causes of death among American troops in the Philippines during* 21 *months, January,* 1910, *to October* 31, 1911. *Mean strength of command for the time was approximately* 11,600.

Diagnoses	Number	Percent of Total Deaths
Liver abscess	2	1.7
Dysentery	5	4.2
Cholera	1	0.8
Malaria	6	5.0
Sunstroke	1	0.8
Blood and circulatory diseases	6	5.0
Tuberculosis	3	2.5
Renal disease	5	4.2
Pulmonary diseases, except tuberculosis	5	4.2
Typhoid fever	2	1.7
Cerebral diseases	3	2.5
Peritonitis and appendicitis	6	5.0
Meningitis	4	3.4
Alcoholism	2	1.7
Miscellaneous diseases	7	5.9
Miscellaneous surgical infections	5	4.2
Suicides	12	10.1
Wounds, injuries and drowning	44	37.0
Total	119	----

The point of special interest in Tables VII, VIII and IX is the comparatively small part played at the present time by tropical

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diseases in the invaliding, the morbidity and the mortality of the American troops serving in the Philippines. Considering as "tropical diseases" the diarrhoeas, the dysenteries, and the chronic enteritis, the liver abscesses, the sprue, the cholera, the malarial and undetermined fevers and dengue, the ring-worm, and the insolation, we find that these combined maladies caused 26.2 per cent of the admissions, 15.2 per cent of the days lost from sickness, and 9.3 per cent of the invaliding and 12.5 per cent of the deaths. The total death rate from diseases (excluding suicides and injuries) approximates 3 *per* 1,000 annually. The amount of disability, death and invaliding now being caused by dysentery and its sequelæ is astonishingly small, being about 6 per cent of the total in each of the three tables. Venereal disease caused one-quarter of the sickness among the 1,000 soldiers, and tuberculosis caused one-quarter of the invaliding home. Aside from tuberculosis, the mental and nervous diseases were the largest causes of invaliding, but a great number of the mental cases were found to have existed prior to enlistment, and a study of the statistics in the reports of the Surgeon General of the Army for the years 1904 to 1909, inclusive, brings out the fact that the incidence of mental and nervouse diseases during the 5-year period was no higher in the Philippines than at home. The number of suicides shown in Table IX may seem considerable, but the statistics from the reports of the Surgeon General for the years 1904 to 1909, inclusive, show that the death rate from suicide was not materially higher in the Philippines than at home. It may be concluded, therefore, that during the last few years there has been manifest no evidence of any serious effect on the nervous systems of our soldiers as a result of the Philippine climate. The more rapid the eradication of the idea that the climate, *per se,* injuriously affects the nervous system, the more rapid will be the decrease of such mild forms of neurasthenia and irritability as are due largely to a preconceived dread of the effects of Philippine residence. It seems to us that the figures in Tables VII, VIII, and IX are strong evidence in favor of the assumption that most of the morbidity, which formerly occurred as a result of residence in the tropics, was due not to the climate *per se,* but to infections which, in the light of present knowledge, can almost entirely be avoided by good sanitation.

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THE DISADVANTAGE OF LEGGINGS FOR ROUTINE WEAR IN THE TROPICS.

Success in combatting the inimical influences of the tropical climate is attained by adapting various factors, such as house, clothing, exercise, food and general habits, to the requirements of the locality. Loose, well ventilated clothing is generally considered one of the requisites for comfort and health in hot countries. The recent order abolishing khaki trousers and requiring the constant use of leggings with service uniform is, in our opinion, a step in the wrong direction. It seems a sacrifice of comfort to appearance, without any compensating gain in efficiency. In the Tropics the leggings, whether leather or canvas, cause increased perspiration of the legs, predispose to skin diseases, probably interfere to some extent with the circulation, and, especially for those engaged in sedentary occupations, add one more discomfort to the many discomforts inherent in a climate where the temperature is continuously elevated. Leggings are primarily adapted to the needs of the man doing outdoor work, particularly when that work is in scrubby country or on horseback. It seems to us inadvisable, for sanitary reasons, to require their constant use for ordinary garrison duty in hot countries. It appears still more undesirable to compel the wearing of leggings by administrative officers doing office duty almost entirely, by medical officers engaged in ward work, in attending labor cases and in operating, by dental surgeons occupied all day in the treatment of the teeth, and by such non-commissioned staff officers as perform duties almost exclusively clerical or administrative. In such cases the leggings can hardly fail to be a cause of irritation and annoyance. Where the general use of white uniform is allowed the above difficulty can be obviated, as far as the commissioned officers are concerned, by the constant wearing of white clothing, but only at increased expense to the individuals for extra garments and for extra laundering.

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CONTINUED ABSENCE OF BERIBERI FROM THE PHILIPPINE SCOUTS.

The favorable conditions as regards beriberi, which were commented on in previous quarterly reports, have continued during

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the months of September, October and November. But a single case has occurred in that time. There have been only 7 admissions for beriberi in the period of 18 months (June, 1910, to November, 1911, inclusive). These figures are to be contrasted with 624 admissions in the calendar year 1908 and 594 in 1909.*. This remarkable decrease in the incidence of beriberi we believe to be due entirely to changes in the Scout ration which were recommended by the Board, first on September 30, 1909, and subsequently on several occasions. In a former special report (3) it was shown that the eradication of the disease had been brought about by a reduction in the amount of rice consumed (20 oz. to 16 oz.) and the addition of a legume to the diet. It was clear that undermilled rice could not have caused the disappearance of the disease because this grade of rice did not come into use until after the cases of beriberi had ceased to occur.

In November, 1910, about six months after the disappearance of beriberi, the old Filipino ration, which had been in use during 1908 and 1909, was resumed except that undermilled rice was substituted for the polished article. This furnished an excellent opportunity to determine the influence of undermilled rice alone, for if not by itself effective in preventing beriberi the disease should reappear in a few months. The disease did not recur during the next seven months (December, 1910, to June, 1911, inclusive), there having been but two cases in this period, one in December and one in January. This appeared to us very good evidence that the unpolished rice was in itself effective, but we looked to the next six months to clinch the matter. Unfortunately for our hopes another change in the ration occurred about the end of June, 1911, as a result of G. O. 60, W. D., May 8, 1911. This order introduced a factor into the dietary which had not been in force during the previous seven months, namely the requirement that 1.6 ounces of beans should be used daily. It also provided that all of the meat must be drawn and that only 16 ounces *per* day of the rice component should be used. After this change it was impossible to draw further conclusions as to the influence exerted by unpolished rice alone, for the reason that the bean is

*These are the figures taken from the records of the Chief Surgeon, Philippines Division. The records as shown in the reports of the Surgeon General of the Army are a little lower. This discrepancy is due to the difference in the methods of recording cases which are transferred from one hospital to another.

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probably an efficient beriberi-preventing article of diet. The dry mongo (*Phaseolus radiatus*) is known to prevent beriberi, and there is no good reason to suppose dried beans would act differently. Furthermore, our experiments showed that an extract of beans administered to fowls subsisting on polished rice was effective in preventing polyneuritis gallinarum.

While the change brought about by G. O. 60, W. D., 1911, was a disappointment to the Board from the experimental standpoint, it was extremely satisfactory from the practical point of view. The Filipino ration established by G. O. 60 is especially well fitted to prevent the occurrence of beriberi. As now constituted the ration complies with the original recommendations made by the Board on September 30, 1909, with the exception that it contains no tomato component. This omission is not considered important.

We believe that the disappearance of beriberi from the Scouts was due solely to the changes in the dietary for the following reasons:

Reason 1. During the years 1910 and 1911 there was no known sanitary improvement, other than dietetic, which could cause the disappearance of beriberi or of any other disease. As a matter of fact the monthly admission rate *per* 1,000 for *all diseases other than beriberi* has not varied essentially during the last four years, having been 69.1 in 1908; 62.2 in 1909; 63.8 in 1910; and 61.1* in 1911. It will be seen that in 1909, when there were 594 admissions for beriberi, the admission rate for other diseases was a trifle lower than in 1910, when there was but 50 cases of beriberi, and not materially different from that in 1911 when there was only three cases of that disease.

Reason 2. It is well known that the beriberi rate for the Scouts has varied markedly from year to year, ranging from 115 to 624 admissions, but since their organization in 1902 there never has been a year in which there was such an extraordinary decrease as occurred in 1911 and the last half of 1910.

Reason 3. At the time the reduction occurred among the Scouts there were no indications of a decrease in the incidence of beriberi in the general Filipino population. The recorded death rate from the disease in Manila was higher in the fiscal year 1911 than for any of the six preceding years, the figures being 406 in 1906; 403 in 1907; 492 in 1908; 924 in 1909; 1,002 in 1910; and 1,515 in 1911.

Reason 4. The Philippine Constabulary is a military organization composed of natives serving under conditions quite similar to those encoun-

*This rate is based on results for first 8 months of calendar year 1911.

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tered by the Scouts. Their beriberi rate has always been much lower than that for the Scouts, probably because of the different manner in which they are rationed. During the first year in which the disease had practically disappeared from the Scouts the monthly admission rates for the Constabulary were showing no tendencies toward a decrease.

Reason 5. The experience in the Civil Government institutions in the Philippines, and in public institutions in other countries, as well as the experimental work of Braddon, Fraser and Stanton, all indicate that undermilled rice will prevent beriberi. Similar experience in different localities has shown that a legume, like the mongo (Dutch *katjang idjo*) will prevent beriberi.

Reason 6. The longer we have studied the form of polyneuritis gallinarum caused by an exclusive diet of polished rice, the more convinced we have become that the disease is identical with beriberi in its pathology and etiology. We can at will cause polyneuritis of fowls by feeding polished rice alone, and can prevent it by feeding undermilled rice, or by administering an extract of rice polishings or a decoction of legumens to a fowl subsisting on polished rice. These experimental observations are, to our minds, very strong evidence that the reduction in beriberi among the Scouts was due to the dietary changes inaugurated in 1910.

Reason 7. The fact that an occasional case of beriberi has been reported at widely separated posts during the period in which the beriberi-preventing ration has been in force is easy of explanation, and does not in the least invalidate our argument. Certain natives from choice subsist chiefly on rice, no matter how varied or extensive may be the ration provided. Many of the Scouts are married and some are rationed separately and eat with their families. In such cases additional rice will be needed and if it can be obtained in the local market the Scout may be depended on to buy the polished article because of its more attractive appearance. It is in this way that we explain the occurrence of the seven cases reported in the last 18 months.

FURTHER EXPERIMENTS REGARDING THE ETIOLOGY OF BERIBERI.

During the quarter we have continued the search for the ultimate substance which enables rice polishings to prevent the development of polyneuritis in fowls that are subsisting on highly milled rice. The latest results are contained in a special report entitled "A Third Contribution to the Etiology of Beriberi" (10). The fact that a large number of amido-bodies failed to prevent neuritis was referred to in our last quarterly report. We have determined that 5 cc. of our extract of rice polishings will protect

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fowls, but that 2.5 cc., equivalent to 2.5 grams of polishings, are insufficient to prevent neuritis. Egg albumen, glycerine, lecithin and extract of onions have all been found ineffective. We have also proved that the neuritis-preventing substance is insoluble in ether and have repeated our former experiments, showing that this substance is removed from the extract by filtration through animal charcoal. We have also completed, with negative results, a series of experiments to determine if fowls fed on polished rice and given large doses of sodium chloride would develop oedema, which is so extremely rare in polyneuritis gallinarum and so common in beriberi. A large number of other experiments are nearing completion, but are not yet ready for report.

THE CURE OF INFANTILE BERIBERI BY THE ADMINISTRATION TO THE INFANT OF THE EXTRACT OF RICE POLISHINGS WHICH PREVENTS POLYNEURITIS GALLINARUM.

A malady, called by the natives *taon, taol* and *suba,* is one of the chief causes of infantile mortality in the Philippines. The disease usually occurs in the first four months of life, and is considered by many, including ourselves, to be infantile beriberi. Most of the mothers show some symptoms of beriberi, the children nearly always die if they continue to feed at the breast, and they usually recover promptly if given modified cows' milk or canned milk. To 15 infants having the disease and which *continued to take the breast* we have administered the extract of rice polishings that prevents neuritis of fowls. Prompt and complete recovery occurred in all. The rapidity with which these patients recover reminds one of the marvelous improvement which follows the use of fruit juices in infantile scorbutus. The extract is easy to make, is inexpensive, is agreeable to the infant palate, and cures the child while it continues to nurse the mother. If the present promise is fulfilled we believe that the use of this extract of rice polishings will lead to a very marked decrease in infant mortality in the Philippines. The matter has been made the subject of a special report shortly to be published (11).

* * * * * *

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THE MEDICAL DEPARTMENT OF THE ORGANIZED MILITIA DEPENDS UPON THE INTELLIGENT AND ENTHUSIASTIC CO-OPERATION OF HEADQUARTERS AND THE LINE FOR SATISFACTORY SANITARY CONDITIONS IN CAMP.*

By Captain HENRY H. DOAN, Medical Corps, National Guard of Pennsylvania.

UNFORTUNATELY, the Medical Departments of the Organized Militia of most of the states are handicapped because no definite rules and regulations have been formulated for them. Until their medical officers are given more authority, they must of necessity depend entirely upon diplomacy to effectuate such measures as they may deem essential for the health and comfort of the troops under their care.

We, the medical officers assigned to the 3rd Reg. Inf., N. G. P., after some years' experience, felt convinced that a sanitary camp could not be satisfactorily or successfully conducted until the hearty co-operation of headquarters, line and the enlisted men was secured. This co-operation we determined to obtain by systematic instruction.

Quite properly, we first outlined our plans to the commanding officer, Col. Caldwell K. Biddle, and he assured us that we could confidently depend upon his support. We might add right here that this was no idle promise; for to this substantial backing, the medical department of the regiment is largely indebted for such success as it achieved at Camp Benj. Chew Tilghman.

With the Commanding Officer's enthusiastic approval we proceeded upon a propaganda of education along sanitary lines; not only among the officers, but also the enlisted men of the command. One of the regiment's regular Friday evening schools was given to the Medical Staff, and the contents of the following General Order (No. 12) were taken up paragraph by paragraph, and the hows and reasons why were fully explained.

*Read by title at the 20th Annual Meeting.

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HEADQUARTERS THIRD REGIMENT INFANTRY,
First Brigade, National Guard of Pa.,
PHILADELPHIA, 22 *June*, 1911.

GENERAL ORDERS,
No. 12.

I. The following circular is approved and published for the information and guidance of all concerned:

OFFICE OF THE SURGEON, 3RD INF. N. G. P.,
PHILADELPHIA, 20 *June*, 1911.

CIRCULAR NO. 1.

In order that the sanitary arrangements of the camp may prove effective, and that there may be uniformity in the general plan and disposition of those things pertaining to the hygienic conditions, the Company officers will observe the following instructions:

Follow strictly the blueprints and specifications in the construction of ice-chests, shelves and tables, and spider crematory, and the arranging and planning of cook and mess tents; thus avoiding the delay which essential alterations would necessitate.

Ice-boxes will be constructed as per blue-print No. 2 (with specifications) and placed as shown on blue-print No. 1. Water in drainage hole to be bailed out twice daily. These ice-boxes are to be kept locked, and are to be used only for the storage of fresh meat, butter, milk and eggs. Meat in front, ice over perforations in rear, and butter, milk and eggs between.

The water barrels in all companies must be uniform in size and color, and placed in mess tents as per blue-print No. 1. Dig drip hole two feet deep by one foot square beneath spigot, and fill with stones. Drain if necessary.

All cook tables to be 3 feet high. Build a table 2 feet wide, from ice-box across tent opening, to a similar table running along entire opposite side of tent. Above the latter table make a shelf one foot wide for canned goods, etc. Cracker and other barrels to be kept beneath this table.

Place a 2x5 foot cook's table at side of fly opposite wood-pile. Erect from back of this table a skeleton framework the length of table and extending 2 feet 3 inches above its surface, studded with large nails. Upon these nails will be suspended such ladles, spoons, pans and other kitchen utensils that can be hung up. Place the others on the shelf below.

To raise stove to a convenient height and conserve the heat, make an 8-inch hollow frame the size of stove base and fill with earth, place stove on this under kitchen fly, with pipe projecting to left of fly pole in line with those of the other companies.

Pile the bulk of the firewood neatly under fly between two posts set in the ground 6 feet apart, one post to be on line between cook tent and fly pole. Kindling for immediate use will be piled to outer end of wood-pile.

SPIDER CREMATORY—12 feet from rear fly pole dig a hole 60x30

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inches and 36 inches deep at left flank and 24 inches deep at right flank. Fill loosely with large stones (cocoanut size) to ground level, and place the spider on the stones in line with those of the other companies. Bank up the sides with flat stones, earth and sods, leaving ends for draft.

Pour all greasy water and other liquid slops among the stones at shallower end of spider, and throw the garbage into the fire. Flatten the tin cans and burn them out so they will not attract flies. Fires must be cleaned of burnt refuse daily. NO GARBAGE CANS WILL BE USED IN THIS CAMP.

No slops or greasy water whatsoever will be thrown upon the ground or into ditches.

Waste paper and other rubbish from camp policing will be burned in the large pits found in rear of the line of latrines, and nowhere else. Persons throwing rubbish into these pits must burn it before leaving.

Tents will be rolled up, and put down PROMPTLY, at the times specified by headquarters.

Special attention will be paid in the daily inspections to the care and cleanliness of kitchen utensils and equipment, including mess outfits. Food will be protected from flies by wire or cotton screening, or by covering with clean cloths. Cooks and their assistants, while on duty, will wear clean, white wash aprons and the white uniform prescribed for the enlisted men of the U. S. Army. No person will be allowed to sleep in the kitchen tents.

A pit, 3 feet square and 4 feet deep, will be dug beneath each water tap, edges to be supported by wooden frame 1 foot deep. In the center of this pit will be placed a box dip hole, 1 foot square, with perforations around the bottom end. The space between dip hole box and frame to be filled with stones, the smallest ones on top.

That unnecessary ditching may be avoided, and the enlisted men taught to use water prudently, it shall only be drawn from the hydrants into buckets provided especially for certain purposes—cooks' buckets, buckets for water, for toilet uses, etc. Water must never be drawn directly from the spigots, except for the sole purpose of re-filling these buckets. A properly designated non-commissioned officer will be put in charge of the hydrants, who will be held responsible for the strict enforcement of this order.

A bench 6 feet long, 2½ feet high, and 1 foot wide will be constructed parallel with wood-pile and outside the fly. Immediately beneath this bench will be dug a trench 4 feet long, 18 inches wide and 18 inches deep, and filled with stones. Waste water from basins will be thrown in this pit. Toilets will be performed here, and NOT under the hydrants. Companies are recommended to purchase individual wash basins for the men.

GEORGE M. COATES,
Major and Surgeon.

By order of COLONEL BIDDLE.

Captain and Adjutant.

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After the officers, the enlisted men, one battalion at a time, were given lectures. The material of the following "NOTICE" was gone over in detail; care being taken in every instance to explain to the men why these things were required or recommended.

NOTICE!

Before evening mess, bathe the feet, dry thoroughly, and dust with talcum powder, changing socks and, if possible, the shoes.

Cleanse the hands before mess and upon leaving the toilet.

Do not turn down the collar or roll up the sleeves, as no sunburn of neck or arms will be treated at hospital tent.

Drink no water except that provided within camp confines.

You are warned against ice cream, milk and fruit not furnished through regular channels.

Urine cans will be placed on the company streets each night. Men discovered urinating on the ground will be brought before a summary court.

Alcoholic excesses DO reduce your powers of resistance, and WILL lower your vitality. Your attention is called to these well-known truths.

At "Sick Call" you will report promptly, in charge of a non-commissioned officer, who will bring book with names of patients properly entered. Emergencies only will receive attention at other times.

Do not fail to report if your bowels remain obstinately costive or continue to be loose for 36 hours.

Air your blankets daily.

Clothing saturated with perspiration must, when possible, be dried in the sun before it is put away in quarters.

Under no circumstances are you to touch the hydrants. Water will be provided in proper receptacles; from these you may procure ample for your needs. You are cautioned, however, not to be wasteful with it. Perform your toilets on the benches provided for the purpose.

When at mess, or at any other time, throw no food stuffs upon the ground. It attracts flies. Flies are more dangerous than an enemy's bullets.

Use only toilet paper in the latrines, and throw no paper whatever on the floors. Especial attention will be given by the Inspecting Officers to the condition and neatness of the sinks.

This card is to be attached, by means of string, to inside of front pole of tent, upper border to be 5 feet from the ground.

In this way we hoped that every member of the regiment, officers and enlisted men, would co-operate with the Medical Department, and make unnecessary, what might seem to them arbitrary directions, what to do and what not to do, that the camp might be maintained in a satisfactory sanitary condition. We wish to

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state that our hopes materialized far beyond our most sanguine expectations.

Inasmuch as transportation is perhaps one of the most troublesome questions to be considered in military problems; we devised an ice chest which could be knocked together upon arrival, and burned upon breaking camp. It proved to be eminently satisfactory; so much so, that with exception of a few trifling alterations, we shall make no changes next year.

Our hydrant pits elicited universal commendation. We attached spring faucets, of the door-knob design, to the hydrants, and by using a cheap galvanized iron pump daily, we were easily able to keep the wells free from water. By the third day we had the men well disciplined in the conservation of the water; subsequently, it was rare that it was necessary to administer reproof for improper use of the hydrants. With the exception of the shallow trenches around all the tents, not one foot of ditching was necessary in this camp.

We must confess we were a bit elated to manage this problem so successfully, without resorting to the customary drains—always troublesome, and rarely satisfactory.

In order that the sanitary arrangements of the camp would prove effective, and that there would be uniformity in the general plan and disposition of those things pertaining to the hygienic conditions, blue-prints, circulars and specifications covering everything were distributed some weeks before the tour of duty.

While a camp may be entirely sanitary, and no common plan be adopted by the companies, we maintain that, should the general scheme projected prove economical and practical, good sanitation is more easily preserved, because satisfactory inspections can so readily be made.

During the week there was never a collection of kitchen offal in our camp. There were no receptacles to contain it. All this material was put under the spider crematories at once. By carefully instructing the cooks concerning the provident use of wood under the spiders, we were easily able to consume all the garbage, using but little more than the original issue of wood provided us upon arrival. In fact, a company or two used no additional wood during the week.

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For the purpose of inspection, the regimental surgeon assigned the 2nd and 3rd battalions to his assistants, respectively, taking the first battalion himself. To each of the 12 hospital corps men was assigned a company, with the understanding that no authority was to be exercised, the duties being purely advisory, and all reports to be made to the medical officers; these men were thoroughly instructed, practically, upon the points worthy of notice. We encouraged a spirit of emulation among them. These men, together with the medical officers, constituted a force of 15 pairs of critical eyes scouting around most of the time. A detailed report of the sanitary condition of the camp for each 24 hours was given to the regimental adjutant.

DAILY SANITARY REPORT.

Station_____Date_____

Command,_____

The Adjutant:

I have the honor of submitting to you a report of the sanitary condition of this Command, for the 24 hours ending_____

	Headquarters	Hospital	Band	A	B	C	D	E	F	G	H	I	K	L	M
Food supply and its preparation															
Drainage and disposal of wastes															
Policing															
Mess Tent															
Cook Tent, including Ice Box															
Hydrant															
Latrines															
Incinerators															
Quarters															
Habits of the men															

Symbols: G—good, F—fair, N. B.—note below.

_____

Major and Surgeon.

For the disposal of camp refuse other than garbage, two "rock pile" crematories were kept in operation. Properly managed, a crematory of this type, 10 feet in diameter, and 3 feet deep, should take care of a camp of 800 men for 5 days.

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No common drinking vessels were allowed to be kept at the water barrels. This compelled the men to use their own tin cups.

The first day or so in camp the company commanders grumbled a bit because they were not permitted to arrange things as they had been doing for some years; but toward the end of the week these same captains were our most enthusiastic supporters.

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A NEW METHOD OF VENEREAL PROPHYLAXIS.

By Surgeon ROBERT A. BACHMANN, U. S. Navy, Executive Officer, U. S. Naval Hospital, Newport, R. I.

VENEREAL prophylaxis in the Army and Navy has come to be generally employed, approximately, since 1908. Prior to that efficient work was done in isolated instances and undoubtedly blazed the trail for the official steps taken by the Navy in 1908 and the Army in 1909 to secure a general and uniform system for reducing the venereal admission rate.

At the present time the double system has practically been adopted by nearly all the medical officers of both services. By the double method I mean the employment of one substance as a preventative for syphilis and chancroid and another for gonorrhoea. The routine and solutions most used in the double method are as follows:

1. Wash penis in 1-5000 Hg Cl_2 solution.
2. Inject 4 c. c. of 20% Argyrol or 2% Protargol solution. Hold in penis from one to five minutes.
3. Anoint glans and shaft of penis thoroughly with 30-35% calomel ointment. Pay special attention to frenum.

This with slight modifications as to strength of solutions and ointment represents what has gradually become the most popular method. It is given to the men upon return from liberty, and is supposed to be efficient up to 8 hours after exposure.

Statistical reports based on this method show that it has not given uniform results, that the venereal admission rates in both services after several years' trial remain almost unchanged, and that only in particular instances where special care was taken to see that the application of the prophylactic was thorough and that educational and punitive measures supplemented it, did the results show any noticeable improvement and that chiefly in the incidence of syphilis.

As to the value of calomel ointment against syphilis I think, after the direct evidence of Metchnikoff, no more need be said. But of the organic silver salts it cannot be stated accurately that

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they possess unusual protective properties. As germicidals they rank very low.

Post and Nicoll* have shown that 10% Protargol and 50% Argyrol solutions have no germicidal effect whatever on the gonococcus after an exposure of one minute and Argyrol exerts no inhibitory effect after ten minutes' exposure. These tests were made by adding a loopful of gonococci growth directly to the solutions and then plating out a loopful of this mixture. This is a much severer ordeal for the gonococcus than mere irrigation of the urethra and a solution that is inert in the laboratory cannot be expected to yield better results clinically.

In spite of such direct evidence as to their worthlessness they continue to be used. So only one-half of the double method receives laboratory support, and I think I may state, also clinical support, which must necessarily follow.

To devise a means combining practicability, low cost and efficiency, I began some time ago to experiment with an application that should possess the triple property of being prophylactic against gonorrhoea and chancroid as well as syphilis.

Beginning with calomel ointment as a necessary ingredient, the next step was to find a suitable antiseptic to fortify its action against the other two diseases. Some good evidence has been adduced to show that calomel ointment inhibits gonococcus growths, but its action against chancroidal infection is by no means certain.

Several other medical officers in both services have compounded similar ointments with the same objects in view. I selected trikresol as the secondary ingredient because in laboratory tests it has been proven the most potent of the phenol group. In 1% solutions it is more active than phenol, chinosol, creolin, lysol, etc., killing not only gonococcus but also streptococcus, pneumococcus and bacillus typhoid after one minute's exposure.

Ducrey's bacillus of chancroid is considered to be no more resistant to antiseptics than the above organisms, hence trikresol seemed to fill both requirements.

As to the method of application, it has been my opinion for a long time that to insure protection against gonorrhoea after a

*Journal Am. Med. Assoc., Nov. 5. 1910.

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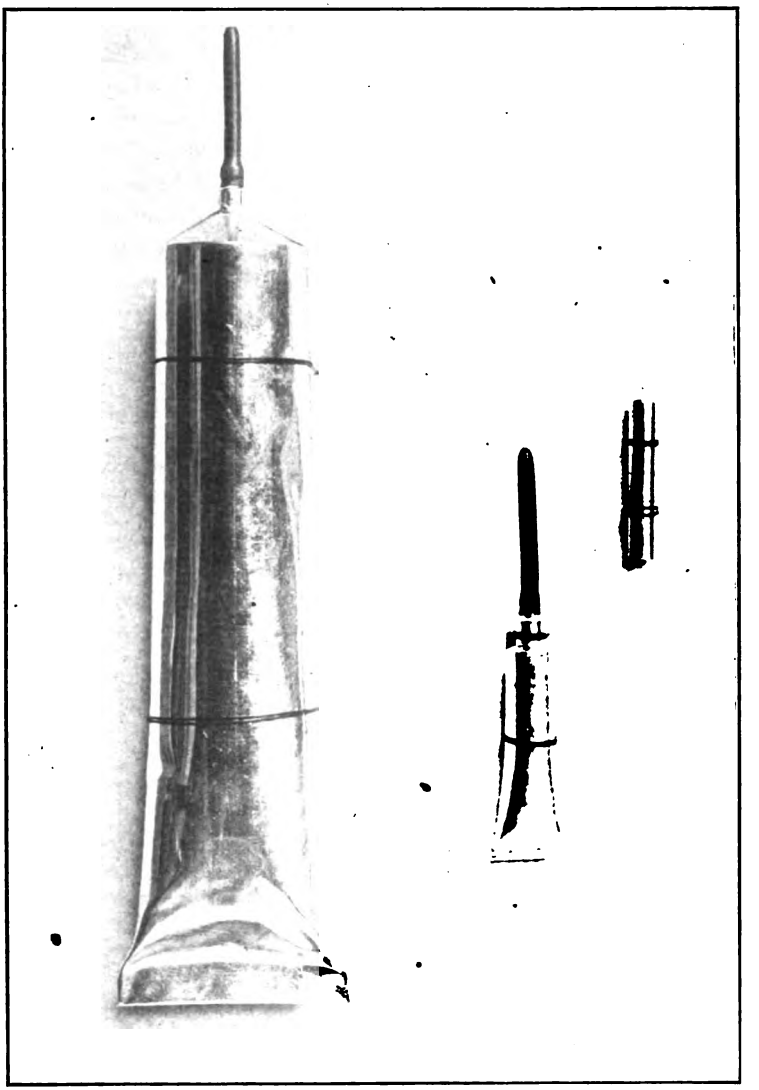

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time greater than an hour the prophylactic must be placed deep in the urethra and must remain there for sometime. An ointment fulfills the latter requirement, and to facilitate its application I devised a soft rubber tip 1½ inches long, which is attached to the end of the tube. The tubes are made of two sizes—the smaller one is intended to be carried on the person and used immediately after exposure. This is the ideal method. The large one is intended to supplement the smaller tube and should be used on board ship on those cases who report exposure without having used a small tube. It contains sufficient ointment to protect 25 men. The rubber tip is to be cleansed with bichloride alcohol after each insertion.

The system of using the tubes is this:

1. *Educational.* The present methods of instruction and education are to be continued. Special explanation of tube must be made and the value of immediate application pointed out.
2. Small tubes are to be carried in ships' stores where they can be sold for fifteen cents. This relieves the Government of most of the expense. Empty tube or empty wooden box which contains tube must be shown on checking in to medical officer after return from liberty. If patient develops disease after showing empty tube, it should be considered that patient has made false statement or has been stupid in following instructions. Restriction of liberty should follow in all cases or a deck court should, in the absence of special regulations, award a loss of pay. It can safely be assumed that the prophylactic was not taken in cases of failure.
3. If men admit exposure and for whatever reason have not used small tube, the large tube should be used. Muzzle inserted as in small tube, 2 c. c. of ointment injected, a similar amount anointed on the glands and skin of penis, particular attention being paid to abrasions or breaks in the continuity of the tissues.
4. Rigid inspections must follow this system as well as any other. Unless the men feel reasonably sure that the occurrence of venereal diseases among them will not go undiscovered, they will make attempts to conceal their disability and, therefore, will not feel required to adopt protective measures.

As to the efficiency of the tube and ointment I wish to report the following experiment:

A patient in the hospital, who was confined to bed a month with fracture, was given liberty and reported gonorrheal infec-

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tion a few days later. It was a clear case. He had exposed himself once, washed penis thoroughly and had had no subsequent intercourse. He gave the name of a girl in a Newport brothel who was examined microscopically and found to be infected completely, urethra, vagina and cervix.

With the co-operation of a member of the Newport Board of Health, the girl was instructed not to use douches and to permit only intercourse with men selected by me for the purpose of experimentation.

Volunteers were secured among the members of the hospital corps and ten men responded. They were instructed to have only one exposure and to use the tube immediately afterwards.

Nine of these men escaped infection. One of them, ten days after his exposure, reported infection. His case was not exactly clear, and investigation revealed the fact that he had returned to the woman in question and exposed himself on three subsequent occasions. The girl stated that at these times he did not use any tubes. This the man also admitted, but sought to excuse himself by claiming he used tubes upon his return to the hospital. As no tubes were available he was confronted with this fact and then stated he had himself refilled some old tubes from a jar of ointment in the dispensary. The only jar of prophylactic ointment was shown to him and he identified it but could not explain how his tube could have been refilled and leave the jar flush full, which it was.

Several days later he admitted that he had not touched the jar but that enough ointment remained in a glass filling syringe to fill his old tube. At best a tube could only have been half filled from this residue, so this was no explanation, and it became evident that he was lying to get "line of duty" on his health record. That this view is correct is proven by the fact that his father has threatened Congressional investigation of me unless the entry be changed.

So this case came unexpectedly as a valuable piece of evidence in favor of the prophylactic.

To make the test conclusive three slides were taken from the woman again and all of them were positive.

Now, as a résumé, I wish to recount the advantages of the tubes under separate heads.

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1. CONVENIENCE.

The small tubes are easily carried and easily used. After contact they can be readily applied, if necessary, in any place such as the toilet rooms of hotels, saloons, etc. The rubber tip cannot injure the urethra and the man will have no fear of using it. The ointment is cream color, of an agreeable odor and does not greatly stain white linen. The tube and its wooden box are plain, so that no suspicion is attached to it.

The large tubes do away with the necessity of having a separate place designated for venereal prophylactic treatment. They require no special apparatus or stands. They consume a great deal less time in application, which is important when as high as three hundred men have to be handled.

2. EFFICIENCY.

The tubes have been proved efficient by actual experiment. They permit immediate use, which is highly desirable, and give men who go on prolonged liberty or leave an opportunity to receive venereal protection. It is the only prophylaxis possible in civil life.

3. COST.

The small tubes can be sold in the ships' stores for about fifteen cents. This places the cost of prophylaxis where it belongs. Four large tubes cost about one dollar. They suffice for 100 treatments. This number of treatments with 20% Argyrol would cost over $4.00; with 2% Protargol it would be slightly more than a dollar, not counting cost of special apparatus and bichloride solutions. I am including cost of calomel ointment with the cost of Argyrol and Protargol.

In the foregoing I have omitted to give figures and experiments substantiating the statements that protection against gonorrhoea and chancroid by the double method is not at all certain, that calomel ointment alone had both direct and indirect evidence to prove its claim as a prophylactic against gonorrhoea and that the single system, with small tubes alone, has already been carried out successfully. This I have done in another paper to which I refer those interested.*

*To be published in N. Y. *Medical Record*.

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VENEREAL PROPHYLAXIS.

By Major WILSON T. DAVIDSON, Medical Corps, U. S. Army.

THE enormous admission and non-effective rates for venereal in our army cannot be but a matter of deep concern to every one. When we compare these rates to those of Continental armies, two questions immediately come to our minds. Why do we have so much more venereal than they? and, is there not some method by which our venereal rate can be reduced? The first question we will dismiss without further discussion, and come immediately to the very practical one of some means by which the venereal rate may be reduced.

It will be recalled that our admission rate for 1909 was 177, and for 1910, 156 per thousand. Can we bring about a continuation of this reduction from year to year, until it is reduced to a minimum? Very much will depend upon the means used and the interest displayed by each individual medical officer.

The mere issuing of an order does not always bring about the result that is desired; for unless each individual post surgeon is imbued with enough enthusiasm to enlist the co-operation of his commanding officer and the different company commanders, and to see that the order is carried out in every detail, conditions will not be improved.

Many plans have been proposed for the reduction of the venereal rate,—lectures to the men, soldiers' clubs, segregation and inspection of prostitutes, etc. They are all good. Each of them would enter to a greater or less extent in the ideal method. But in studying this question, we might as well admit one thing, and then take up the problem as it then stands; and the thing to be admitted is this: As long as we have a lot of young men together, and a lot of prostitutes in a neighboring town, or at any accessible place, the men are going to get to the women. This may be shocking to the sensibilities of some people, but nevertheless it is a fact; and it is actual conditions and facts that we want to deal with. Furthermore, we know that so far as segregation and inspection of prostitutes is concerned, very little has been done in that line in the various municipalities in the United States. And it will be readily admitted that a high per-

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centage of prostitutes harbor some kind of venereal infection. And now we come to the question as it stands: An absolute certainty of an exposure of a certain percentage of the men to venereal infection: what is the best method of getting rid of that infection and thereby reducing the venereal rate? This is the task before us just as it stands, after we have done all in our power to keep the men clean.

Upon my arrival at Fort McIntosh, Texas, for station, I found the prophylactic method in use was as follows:

"1. Calomel ointment, 30%.

"To be rubbed on penis (prepuce and glands) before illicit intercourse.

"2. Bichlorid, 1-4,000.

"To be used as a wash after illicit intercourse on returning to quarters.

"3. Argyrol, 50%.

"One or two drops to be dropped into the urethra after washing with the bichlorid. Dropped from dropper—dropper to be rinsed with bichlorid after use.

"Ointment boxes are furnished to be issued when necessary.

"Bichlorid tablets are furnished to replenish bottles when necessary.

"Syringes are furnished to be issued when necessary.

"All the above will be furnished on application to the hospital at any time."

This method was in use for four months. The idea of the surgeon in directing the use of the calomel ointment before going out on pass was that if the men went to town they might get drunk, and that if they then exposed themselves to infection they would be prepared for it; whereas, if they were given the ointment to be used after contact they might forget it. A rather new and original plan of avoiding the results which so frequently follow the association of Bacchus and Venus It may be objected to this plan that the use of the ointment before going out would suggest to the men that they should go to the red-light district; while if they had not used the ointment it might never occur to them to expose themselves to infection. It is an example of the power of suggestion. As to the results of this plan, the records show that for the year ending March 31, 1911, there was an admission

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rate of 160 per thousand, about the average rate for the entire army.

About the middle of June a supply of "K" tubes arrived. These were filled immediately and issued to the companies. At this time the question of punishing a man for failure to use the "K" packet was considered. Would we punish the man for lying who claimed he had used his "K" packet and subsequently developed a venereal disease? No, for it was not claimed that the tube was absolutely infallible; and, besides, the soldier could not be expected to carry out the directions as carefully as one who understands the principles of disinfection. There was one thing we could do, and that was to make each man report to his first sergeant, upon his return, whether or not he had exposed himself to infection; and, if so, whether he had used his "K" packet.

Accordingly an order to this effect was issued June 16, 1911; and at the same time, in one of the lectures, the method of using the "K" packet was explained very thoroughly. This was considered so important that the following directions for the use of this "K" packet were attached to the order regulating their use:

"DIRECTIONS FOR USE OF 'K' PACKET."

"1. Immediately after sexual intercourse urinate and wash penis, using plenty of soap: dry.

"2. Next pull back foreskin, grasp head of penis with thumb and index finger, and with the other hand insert small end of tube into the urethra, and squeeze out the medicine. Hold this medicine in the urethra by means of thumb and index finger for five minutes.

"3. Open the large end of the tube, squeeze out the salve, and rub it all over the head and foreskin of the penis.

"4. These directions are most effective when carried out immediately; but they do some good when applied as late as 12 hours afterwards."

Particular stress was laid upon the importance of a thorough washing with soap and water.

Our hopes were very high at the time this order was issued. We expected great things from it. But cases of venereal, all sorts of them, continued to come in. When asked if they had used the "K" packet, the men would all answer in the affirmative.

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And who could say that they had not? We had no way of finding out. By reference to Table 1, "New admissions for venereal," it will be seen that things were not at all improved after this order was issued. In fact, the number of fresh cases coming in set us to thinking about the source of infection itself, and whether something might not be done in that line. Accordingly after consulting with the Commanding Officer, the following letter was written. As an inclosure was sent an outline for a municipal ordinance for the segregation and inspection of prostitutes:

FORT MCINTOSH, TEXAS,
August 8, 1911.

The Honorable City Council,
Laredo, Texas.

GENTLEMEN: I have the honor very respectfully to invite your attention to a problem that I consider of far-reaching importance both to the military garrison at this place and to the citizens of the town of Laredo. It is the subject of prostitution and venereal diseases.

In this connection it may not be inappropriate for me to invite your attention to certain phases of the venereal question. That certain acute infectious cases exist now in Laredo is proven from the number of cases of venereal disease in soldiers that have recently come to me for treatment. So far as the soldiers are concerned, we take every precaution possible to prevent them from spreading infection.

(a) No man with venereal disease is allowed to go to town.

(b) Lectures are given to the soldiers at frequent intervals, explaining the nature of venereal diseases, how contracted, and the use of the "K" packet, a small package containing argyrol and calomel ointment, to be used as a preventive after sexual contact.

(c) Men returning from pass are required to report to the first sergeant whether or not they have exposed themselves, and if they have exposed themselves, whether they have used the "K" packet. If good evidence can be adduced that a man who has contracted a venereal disease has not used his "K" packet, he is court-martialed. Within the last three weeks, I have admitted three cases of primary syphilis to the hospital for treatment. In each case I have gotten a statement from the man as to where the disease was contracted.

While I realize that the venereal problem is a difficult one to handle, it does seem that something could be done on the part of the city authorities of Laredo to control the spread of these diseases. People would hold up their hands in indignant horror if we allowed cases of smallpox or scarlet fever to roam at large. Yet, here we have diseases that are far worse in their consequences, and with absolutely no restriction whatever placed upon their spread. I also realize that in bringing up the question of venereal disease, or the "social evil," I am broaching a subject that most people would prefer to dismiss.

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It is a distasteful subject, and they reason this way: It is wrong for young men to have illegitimate sexual intercourse; they should so cultivate their minds that they will never think of doing such a thing; and if they do, let them take the consequences.

But there is another way in which to consider this question. Prostitution has existed as far back as we have any recorded history; and it will probably continue to exist so long as human nature does not change. Admitting then that a certain evil is certainly going to exist, is it not better to put it under strict sanitary control than to ignore it and let disease spread from one person to another. And it is not the young man himself alone who catches a dose of gonorrhoea or syphilis who is the sufferer. The innocent must suffer also, and then the taxpayer. It has been estimated that 30% of all operations done upon women are for diseases that result from gonorrhoeal infection. These are innocent women, the wives of men who have been married anywhere from two to twenty years, and who, when they were married, thought that they had gotten rid of an old case of gleet that had been hanging on for several years.

Not being entirely well, they infect their young wives, and as a consequence, a few years afterwards, an operation must be done for the removal of tubes or ovaries. Then again we all know what a high per cent, estimated at 30, of patients in asylums for the blind, have incurred their disability from gonorrhoeal ophthalmia contracted at childbirth. Not only the innocent mother is made to suffer, but also the children. And again we know that a large per cent of the inmates of our asylums for the insane are cases of paresis or dementia brought on by syphilis. Now who has to support these asylums for the insane and blind? Evidently it is the taxpayer; and a little care and attention directed right now to the proper sanitary regulation of prostitution, might save hundreds of thousands of dollars in years to come for the care of the blind and insane, not to mention the suffering that might be saved in the cases of the innocent wives who are diseased and children blind as a consequence of these loathsome diseases.

The plan I have made out is merely an outline embracing the principles for the control of venereal. The gist of the whole problem is just simply this: if there is a case of venereal disease anywhere in town, whether it be a clandestine prostitute or public whore, it should be made known at once to the proper authorities, so that the case can be put under control and cured up as soon as possible, thereby preventing any further spread.

Very respectfully,

W. T. DAVIDSON,
Major, Medical Corps, U. S. Army,
Surgeon.

OUTLINE OF AN ORDINANCE FOR THE REGULATION OF PROSTITUTION.

1. Clandestine prostitution not to be tolerated. All prostitutes to be registered, and each one furnished with a book in which shall be given her name, age, nationality and address.

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2. All prostitutes to be segregated. They should be made to occupy a certain section, or certain sections of town. Each house of prostitution shall be required to furnish suitable basins, water, disinfectants, etc., for purposes of cleanliness. Prostitutes of said houses to be held reponsible that they be kept in order, and no liquor to be sold in such houses.

3. Every prostitute to be inspected once a week by the City Health Officer, for which examination she shall be required to pay a suitable fee (usually $1.00), and the result of this examination recorded in the book. This examination to be good for one week.

4. Those found diseased shall be put under treatment by the City Health Officer "in quarantine." Not to be allowed to ply her trade until pronounced non-infective by the Health Officer. Any prostitute found plying her trade when she is so diseased as to be able to transmit this disease to others, shall be punished.

5. No prostitute shall change her residence without permission, and those prostitutes coming into the town of Laredo from other places to be required to comply with the provisions of this ordinance before engaging in their trade.

6. Any prostitute becoming diseased at some period intermediate between two weekly inspections, shall be required to report her condition immediately to the City Health Officer, for treatment.

We waited to see what they would do. Finally they did meet and our communication was read, together with the strong indorsement that the Commanding Officer had put upon it; but that was all it amounted to. Nothing was ever done. Laredo is a town of about 18,000 inhabitants, 3,000 of them being Americans and the rest Mexicans. It has had a bad reputation for many years on account of the low class of the prostitutes, and the excessive venereal rate. Like most towns in the United States, they care nothing for sanitation; it is a matter of decidedly secondary importance to them.

Seeing that something further would be necessary, if the venereal rate were to be reduced at all, it was decided that it would be an additional precaution to have the men come to the hospital for further treatment after they had reported to their first sergeants that they had exposed themselves. The plan was to require each man to go to the hospital where he would report to a certain hospital corps man for treatment. This man was directed to instruct each man carefully how to take his injection (silver nitrate 1-1,000), and to hold it five minutes. After the injection calomel ointment to be rubbed on the glans and foreskin. A record book was kept giving each man's name and date of treatment. Similarly, a record book was to be kept for each company

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giving date of issue to each man of "K" packet, date of report of exposure, etc.

This plan was embodied in the following order:

FORT MCINTOSH, TEXAS,
August 31, 1911.

* * * * * * *

I. It is a well-known fact that a high percentage of prostitutes have some kind of venereal disease; and at the present time, no effort is being made on the part of the city authorities either to inspect the prostitutes to see if they are diseased, or to cure them of their diseases after they have contracted them. Venereal diseases are not to be considered as slight ailments. Syphilis is sometimes followed by spinal trouble, tumors of the brain and liver, and insanity; gonorrhoea is liable to be followed by all sorts of complications which may take years to cure. In view of these facts the men of this command are earnestly enjoined not to frequent houses of prostitution. Women found on the streets and those living in houses claiming to be respectable are nevertheless prostitutes, and are even more dangerous than those living in well regulated houses of prostitution.

Any man who has had sexual intercourse with any of these women will immediately follow out the directions for the use of the A. & N. protection tubes.

One of these tubes will be used after each sexual contact.

Those men exposing themselves to infection at places where there are no means, such as basins, soap, water, etc., for the carrying out the directions for the use of the A. & N. tubes, will come immediately to the barracks, and then carry out the aforesaid directions.

II. Every enlisted man who exposes himself to venereal infection will, immediately upon his return to barracks, or at least within 12 hours of said exposure, report to his first sergeant the fact of said exposure, and whether or not he has used the A. & N. tube.

Company Commanders in carrying out these instructions will arrange as follows:

(a) Procure and see that there is always on hand a sufficient quantity of A. & N. protection tubes.

(b) The routine issue of A. & N. protection tubes is not allowed. They will be issued only to those men who ask for them.

(c) Not more than one A. & N. protection tube will be issued to any one man at one time.

(d) In each company there shall be kept on hand a record book showing the following:

(1) Name of each man in the company followed by dates of issue of A.& N. protection tubes.

(2) Date and hour of day of report of exposure to venereal infection.

(e) That copies of this order and of the instructions for the use of pre-

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ventives are at all times posted in the quarters and bath rooms so as to necessarily become known to the members of their companies.

All other members of the garrison will obtain the prescribed preventives from the post hospital.

The Surgeon will conform to the foregoing instructions as to issue and use of the prescribed preventives by members of the hospital corps, and see that they report to the senior sergeant of the hospital corps as to exposure and use of preventives as herein above directed for other enlisted men of the command.

III. Every man who reports to his first sergeant as having exposed himself to venereal infection, will be sent to the post hospital for further treatment. Those reporting between the hours of 7:00 p. m. and sick call will be sent to the hospital between 6:00 and 7:00 a. m.

* * * * * * *

The A.& N. protection tube not having arrived, the "K" packet was used in its stead.

At the same time the Commanding Officer issued an order directing the officer of the day to patrol the streets of Laredo at various times during the evening of pay day, and for the two succeeding days. Any man found under the influence of liquor, it was ordered, should be put in an ambulance and taken to the guard house.

The results we have obtained under the last order have been very gratifying. (See Table No. 1.) Out of 127 exposures to date we have not had one single case of infection among those who took prophylactic treatment. (Attention invited to Table No. 2.) And the one man who did report with a case of gonorrhoea, was tried by court-martial and convicted for failure to report to his first sergeant. This man reported November 17, with a case of acute gonorrhoea, stating it was his first attack. Questioned as to when he had exposed himself, he said his last exposure was on October 15. The venereal book at the hospital was consulted and his statement as to date of last exposure verified. The record book at his company was also consulted and the same record found. If his statement were true, the period of incubation must have been a month. The man was tried for failure to report to his first sergeant at the time he actually did expose himself. Pay day was on November 9, and a great many men had exposed themselves on that day. (Attention invited to Table No. 2.) At the trial the man claimed that he sometimes got drunk and that while in this state he would do things of which he would have no recollection when he became sober. From the

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fact that 127 men have reported for prophylactic treatment, one is led to believe that there are very few, if any, men who fail to report to their first sergeant, if they have used their prophylactic tubes. They are afraid not to report. In the first place there is a check on them at their company quarters, and in the second place, a check on them at the hospital. Take the case of the man who was court-martialed. The men soon find out that the only safe plan for them to pursue is to report every time they expose themselves.

And suppose some man who has failed to report his exposure to infection and subsequently develops a disease, fails to report for treatment, in order to conceal his disease and escape punishment.

Regular bi-monthly physical inspections had been made up to the time this order was issued. Then they were made bi-monthly. Besides in this Division, there is an order requiring weekly physical examinations to be made immediately after the Saturday morning inspections, by an instructed non-commissioned officer. As yet, no case of venereal has been discovered for the first time at these inspections.

It may be objected to this plan: Why use both a prophylactic tube and the toilet method? Is not one method sufficient? No, because neither method is ideal. The men can not be depended upon to use their prophylactic tubes properly. They may either forget them, or use them improperly. And all such cases get a treatment upon their return to barracks. And if this treatment is given promptly, as we require it to be given, it has been proven to be very good. As is well known this is the method used in the Navy. Of course those who have treated themselves properly immediately after exposure are required to take another treatment; but that will do them no harm, and the additional expense is as nothing compared to an additional burden to the sick report.

To summarize. The path of the man who exposes himself to venereal infection is not strewn with flowers. In the first place, any man found in the streets under the influence of liquor is put in an ambulance and carried to the guard house. And those who do expose themselves are required not only to use a protection tube, but to report upon their return, and then they are subjected to further treatment. Those who fail to report are tried by summary court. Reporting to the sergeant is equivalent to get-

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ting another treatment. And finally those who do develop a case of venereal are put "in quarantine," i. e., they are not allowed to leave the limits of the reservation.

And now we come to the answer to our original question, and it is this: adopt some carefully thought out plan of prophylaxis, and some means whereby the soldier may be punished for failure to follow the prescribed plan.

And how may this plan be carried out with the most effective results in the whole army? Shall each Post Commander adopt a plan to suit himself? Or shall this matter be regulated by each Division Commander? It is thought that a uniform method for the entire army would be most effective. A general order giving specific instructions to Post Commanders about lectures on personal sanitation, physical inspections and venereal prophylaxis; and prescribing punishment for those men who fail to comply in every detail with the plan laid down for venereal prophylaxis. It is believed that by carrying out the plan of prophylaxis that I have detailed above a decided reduction can be brought about in the venereal rate at any post.

TABLE No. 1.

Showing number of new cases of venereal infection from each organization admitted during months from April to October, 1911, and number of new cases from all causes; number of days lost in hospital from venereal disease, and number of days lost from all causes; together with percentage of non-effectiveness from venereal disease, and the percentage of non-effectiveness from all causes.

ADMISSIONS FOR VENEREAL DISEASE.

Organizations and months	April	May	June	July	August	Sept.	Oct.	Total
"A" 23d Infantry	1	2		1				4
"B" do	1	1		1	1			4
"C" do	1	3		2	2			8
"D" do		1		2	2		*1	6
"B" 3d Cavalry			1					1
Det. H. C.								
Total	3	7	1	6	5		1	23

ADMISSIONS FOR ALL CAUSES.

Organizations and months	April	May	June	July	August	Sept.	Oct.	Total
"A" 23d Infantry	6	4	7	3	2		1	23
"B" do	9	6	5	2	4	6	1	33
"C" do	2	9	5	11	4	3	2	36
"D" do	6	3	4	4	8	5	3	33
"B" 3d Cavalry		3	2	1				6
Det. H. C.					1	1		2
Total	23	25	23	21	19	15	7	133

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NUMBER OF DAYS LOST IN HOSPITAL FROM VENEREAL DISEASE.

Organizations and months	April	May	June	July	August	Sept.	Oct.	Total
"A" 23d Infantry	7	28	30	16	27	7	0	115
"B" do	16	4	0	24	2	16	6	68
"C" do	5	27	0	75	34	0	0	141
"D" do	0	10	6	22	51	20	13	122
"B" 3d Cavalry			17					17
Det. H. C.								
Total	28	69	53	137	114	43	19	463

NUMBER OF DAYS LOST IN HOSPITAL FROM ALL CAUSES

Organizations and months	April	May	June	July	August	Sept.	Oct.	Total
"A" 23d Infantry	27	9	51	71	27	7	10	232
"B" do	28	60	106	40	25	22	44	325
"C" do	9	45	58	102	108	67	54	443
"D" do	9	24	48	57	83	28	32	281
"B" 3d Cavalry		2	17		0	0		19
Det. H. C.					2	3		5
Total	73	170	280	270	245	127	140	1305

Average strength of command	Apl. 358	May 393	June 402	July 378	Aug. 324	Sept. 308	Oct. 303	Total
Percentage of non-effectiveness venereal	.26	.56	.44	1.16	1.13	.46	.20	
Percentage of non-effectiveness from all causes	.67	1.39	2.32	2.30	2.31	1.36	1.52	
Percentage of admissions for venereal disease								23.57

*This man was tried and convicted by summary court for failure to report to his sergeant after exposure to infection.

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TABLE NO. 2.

PROPHYLACTIC TREATMENT GIVEN AT HOSPITAL.

SEPTEMBER.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	Total
"A"												7																			7
"B"												12	2	1	1						1			1							18
"C"							1			1		10							1												13
"D"										2		14	1	1	1			1													20
H. C.												1											1								2
Total							1			3		44	3	2	2			1	1		1		1	1							60

OCTOBER.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	Total
"A"	1				2		1			11					1	1	1	1														19
"B"		1								6	1			1	1			2														12
"C"										9	1				6	1			2			1	1									21
"D"								2		6								1														9
H. C.								3		2						1																6
Total	1	1			2		1	5		34	2			1	8	3	1	4	2			1	1									67

Total number of treatments given for all organizations during months of September and October ---------- 127
Number of cases of venereal diseases among those receiving prophylactic treatment during months of September and October—None.
September 11, was pay day.
October 9, was pay day.

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Additional Note. Since the above article was written the scheme for prophylactic treatment as outlined above has been continued during the months of November, December, and in January to the 23rd. In November "I" Troop, 3rd Cavalry, came to Fort McIntosh for station; and on January 23rd the 1st Battalion, 23rd Infantry, left Fort McIntosh, leaving the troops of Cavalry to garrison the post.

Below are given the results of prophylactic treatment for the months of November, December and part of January—to the 23rd.

NOVEMBER.

	Treatments given	Infections
"A" Co.	19	1 (a)
"B" Co.	13	
"C" Co.	15	
"D" Co.	18	
"I" Troop		
Hospital Corps	2	
Total	67	1

DECEMBER.

	Treatments given	Infections
"A" Co.	15	
"B" Co.	10	
"C" Co.	25	1 (b)
"D" Co.	14	
"I" Troop	11	
Hospital Corps	1	
Total	77	1

JANUARY.

	Treatments given	Infections
"A" Co.	14	
"B" Co.	7	
"C" Co.	13	
"D" Co.	11	
"I" Troop		
Hospital Corps	5	
Total	50	

(a) Did not use "K" packet. No packets on hand in his Company at this time.
(b) Reported that he used "A. & N." tube but did not report to his first sergeant upon his return to quarters. Tried by Summary Court Martial and given one month's pay and a month in guard house.

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SUMMARY.

Total number of prophylactic treatments given during the period September 1, 1911, to January 23, 1912=320.

Number of cases of infection during this time—3.

Of these cases, one failed to use his "K" packet, and the other two failed to report to their first sergeant upon their return to quarters. Thus it will be seen that there has been no case of infection among those who have carried out in full the scheme for prophylactic treatment as outlined above.

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A SCHEME FOR CARRYING OUT VENEREAL PROPHYLAXIS IN ARMY POSTS.

By First Lieutenant H. H. SMITH, Medical Reserve Corps, U. S. Army.

"ENOUGH is shown, however, to make clear the futility of the present method of leaving this most urgent question to the individual initiative of local commanders and their medical advisers. Not only is there a wide diversity of method, but in the matter of interest the whole gamut is displayed between utter neglect and earnest zeal. It is, therefore, plainly necessary for the War Department to take hold of the matter, and it is believed that sufficient experience has accumulated to afford basis for a clear cut, vigorous and successful policy."

Apropos to the remarks of the Surgeon General in his report for the year of 1911, it would seem as if it would be proper to propose an entirely new system from that now in force rather than try to explain why the different systems used in the past have not been a success.

The author submits some ideas gathered from handling a large number of venereal cases in the Philippines and in the United States, and he has taken the liberty of incorporating any idea that seems to him to be of value, and should any of his fellow officers find any of his ideas in this paper he should claim it ere he loses it.

This article presupposes that Congress has passed a law taking away the pay of soldiers suffering from venereal diseases and while paying the penalty for the same.

Beginning with the organization commander, we would demand through the Commanding Officer, that there be kept in the water closets a section (one stall) which all venereal patients are compelled, under penalty of court martial, to use in washing their hands and faces and attending to the wants of nature, they being not allowed to use any other part of the water closet, excepting the part used for shower baths. In this stall should be a wash basin, soap, towels, and so forth, also stools and urinal. This stall should be used by venereal patients only and it should be

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plainly marked so that other soldiers will not use it by mistake. A non-commissioned officer should be placed in charge and made responsible for its cleanliness.

The clerk of the organization should keep a roster of the men belonging to it, arranging same alphabetically and numbering, beginning with "1" and going up, with each name as it appears. A copy of the roster and any new names or numbers should be furnished the hospital each month. With the above the sanitary duties of the organization end and the work of the medical officer begins. Such officer should be held solely responsible for the working of the sanitary scheme and if possible it should be the work of one man, and not be divided among the medical officers on duty at the post.

Every post has one main entrance, through which the inhabitants pass in and out. Near this, but not in plain view, should be a room or building at least 10 by 12 feet square, this place to be known as the "pass gate." At this gate should be stationed an enlisted man of the hospital corps, he being relieved at stated intervals by another corps man. At this gate in the room or house should be kept all the utensils used in preventing venereal discases. The hospital should issue to the different organizations each month a package of passes similar to the copy below.

Depart	Return	Depart	Return
____ a. m.	____ a. m.	____ a. m.	____ a. m.
____ p. m.	____ p. m.	____ p. m.	____ p. m.
Pass number ___ between		Pass number ___ between	
__ a. m. and __ p. m.		__ a. m. and __ p. m.	
Date _____, 1912.		Date _____, 1912.	
Treat	Yes No	Treat	Yes No

No man shall be allowed to leave the post without first procuring a pass from his organization and on his departure he will leave the pass at the "Pass Gate" with the corps man who will enter upon both sides of the pass the date of departure and upon his return he will enter the date of return and give the soldier prophylactic treatment. If the soldier states that he has not had any contact or that he is married, he shall return him the pass with the word "No" scratched out, and if he has been treated the

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word "Yes" shall be marked out. The soldier takes his half of the pass to the barracks and is checked off the roster and the corps man keeps the other half to return to the hospital when he goes off duty, and it is checked off from the organization roster at the hospital.

Should the soldier be interested in his health enough to ask for a "K" package he will be given a small compact package, on which is placed the same number as his pass with instructions to return the package or have the sum of 50 cents charged against his pay. (This being done to keep him from selling his package or throwing it away.) It is understood that having the package in his possession does not excuse him from treatment on his return to the "Pass Gate."

The hospital, having one-half of the pass and the roster of the organization, is able to tell by checking up just who has had treatment and who has not.

Once every two weeks the medical officer should inspect each organization; this inspection should be made without any previous notice and the inspector should have authority to make the inspection in the name of the Commanding Officer. Should men be missed at this inspection, their names should be placed on the sick book, and they be inspected at the hospital the following day. It is thought that with a strict "check" at "Taps" showing any absentees that few if any can escape from treatment.

The above plan may be criticised owing to the fact that a soldier may "jump the guard" and acquire venereal disease outside, and finding that he has it "go on pass" and receive treatment, or he may acquire venereal disease on the military reservation and "go on pass" to receive treatment, and then claim that he has obeyed orders and that the treatment did not prevent the disease.

The above objection can be obviated by establishing a period of incubation of about four days, and dating back the date of contagion that number of days; if the soldier has not been checked on that date for a pass he is guilty of disobeying orders.

The penalties for disobedience of orders for sanitation should be something as follows:

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1st. The soldier who has taken all treatments and obeyed all orders, "in line of duty" full pay, should he contract venereal disease.

2nd. The soldier who disobeyed the orders "not in line of duty" loss of pay, summary court, 10 days fatigue.

3rd. The soldier who made a false statement to avoid treatment the same as No. 2.

It is believed that diseases treated outside of the hospital do better than those treated inside. There is very little that a soldier has to do that will interfere with the treatment in any way, and should cases become severe they can be put in the hospital.

While it is the design of the author to do away with as much paper work as possible, yet it is necessary to have a complete check of all venereal patients, and the following form is suggested for use of all patients treated outside.

This card is completed every month and sent to the Surgeon General. Should the case be cured before the end of the month it is kept to be sent with the rest of the reports each month.

Most of the history on the blank is kept by punching out the different spaces denoting certain treatment. The punch used may be similar to a conductor's punch.

No. _____
Acute _____
Chronic _____
Injection _____
Irrigation _____
Internal Med. _____
Syphilis _____
Primary _____
Secondary _____
Tertiary _____
Wasserman _____
Date _____ 1912
Date contracted _____ 1912
In line of duty _____
Not in line of duty _____
Cured _____
Not cured _____
Date _____ 1912
Transferred to _____
Surgeon who treated patient _____

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Name of patient ----------

Organization ----------

Directions to be printed on back of card.

One of these cards to be filled out for each patient. This card to be sent to each hospital the patient may be transferred to during the month.

This card should not be taken up on sick and wounded except at station where it is originally made out; at the end of each month to be sent to the Surgeon General through Chief Surgeon of Division, and a new card started for the month. Organization rosters as furnished by clerks shall be kept in record office in hospital.

The above paper is founded on the following conclusions of the author as enumerated below:

1. There has been a lack of system for venereal prophylaxis in the different posts.
2. Too much has been left to the individual soldier.
3. Venereal prophylaxis should be put in the hands of one medical officer and he held solely responsible for the carrying out of the same.
4. Some soldiers like "hospital bunk fatigue" but all hate to have their names on a venereal register and do not like "not in line of duty," hence they try to hide their disease.
5. Illustrated monthly lectures and semi-secrecy for the individual soldier meets with his approval and gains his confidence.
6. Venereal inspection with previous notification is a failure.
7. Medical officers cannot do their full duty because there are too many conflicting opinions to be respected.
8. In posts of over a battalion a medical officer should devote his entire time to venereal work.
9. No treatment of any kind should be allowed in the men's quarters and officers of the line both commissioned and non-commissioned should not have anything to do with the treatment of the men.

It is realized in closing this paper that there are many details not considered but they have been purposely left out awaiting a time when this scheme might be tried in a practical way.

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EXPERIMENTS WITH THE A. & N. TUBE TO DETERMINE ITS EFFICIENCY AS A GONOCOCCOCIDE.

By Major F. F. RUSSELL, Medical Corps, Curator, Army Medical Museum, and Captain HENRY J. NICHOLS, Medical Corps, Army Medical School.

THESE experiments were made in the laboratory of the Army Medical School, by direction of the Surgeon General, to determine by careful and conclusive experiments whether the calomel ointment suggested by Col. L. M. Maus is an efficient disinfectant for gonorrhea. They required a good deal of time, as it was necessary to secure cases from the Walter Reed Hospital, Washington Barracks and Fort Myer, and these cases could only be obtained as they developed. The ideal method to test a prophylactic against gonorrhea would be, of course, by experimenting with animals which would develop well marked lesions. This, however, is impossible, as animals are not susceptible to infection with gonorrhea. In view of a possible misunderstanding of this point the following quotation from Kolle and Hetsch (1911) is given: "In no kind of animal and by no method of inoculation has it been possible up to this time to cause the gonococcus to multiply and to produce lesions." We made several experiments with the conjunctivæ of kittens and puppies with no results.

It did not seem justifiable to attempt to experiment with human infections, and a method was therefore adopted which has been used before in testing disinfectants in the urethra and which seems fairly conclusive. In brief, it consists in making cultures from the urethra before and after the application of a disinfectant.

Prophylactic treatment is to be used as soon after coitus as possible, before the gonococci have left the surface of the mucosa and penetrated to the deeper layers of the epithelium. All that is needed, therefore, is surface sterilization if the remedy be used early. In our experiments the penetrating power of the medicament has been disregarded, and surface sterilization alone attempted.

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As soon as a fresh case of gonorrhea developed in any of the three posts mentioned above, the patient was sent to the Army Medical School. Smears were made from the urethral discharge to establish the diagnosis; if the case was suitable, cultures were made on 2 to 4 tubes of ascitic fluid agar. The disinfectant was then applied to the urethra, where it was retained one to two minutes when the excess was allowed to escape; the patient waited 10 to 15 minutes, then urinated, when fresh smears and cultures were made from fluid expressed into the meatus. The cultures were incubated 48 hours and suspicious colonies examined by a Gram's stain. No case was included unless the first culture and both smears were positive. With a little practice this technique was very satisfactory. The preliminary cultures grew well, often in pure culture, so that they could be used in the preparation of stock vaccines. The second smears showed more epithelial cells than the first and many gonococci. The accompanying table summarizes the results.

The original tubes of A & N packet that we received were effective in 7 out of 8 instances. The tubes received later, together with their separate ingredients, failed in 8 out of 8 cases. The explanation of these results is quite clear. We were led to believe, by the circular issued from Headquarters, Central Division, Chicago, Ill., August 15, 1911, that the composition of the tubes originally furnished was:

Calomel	30
Carbolic	3
Lanolin	67

When experiments showed that these tubes were effective, we prepared two different ointments containing the separate ingredients, in order to determine if one or both were effective.

Calomel	30	and	Carbolic Acid	3
Lanolin	70		Lanolin	97

Neither of these ointments was effective, and we noticed that in color and consistency they did not resemble the contents of the original tubes. After injection the excess of the ointment came out of the urethera in a ribbon form and did not spread over the

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TABLE GIVING SUMMARY OF EXPERIMENTS.

Number	Date	Smear	Culture	Treatment	Smear	Culture	Result
1. O.	8,26,11	+	+	A. & N. (old)	+	—	Gonococci killed.
2. K.	8,30	+	+	" "	+	—	" "
3. R.	8,31	+	+	" "	+	—	" "
4. S.	9,5	+	+	" "	+	—	" "
5. T.	11,15	+	+	" "	+	+	Few Colonies.
6. K.	11.20	+	+	" "	+	—	Gonococci killed.
7. B.	1,23,12	+	+	" "	+	—	" "
8. G.	2,5,12	+	+	" "	+	—	" "
9. E.	9,15,11	+	+	Argyrol 10%	+	—	" "
10. D.	9,15	+	+	" "	+	—	" "
11. P.	9,19	+	+	" "	+	—	" "
12. M.	9,19	+	+	" "	+	—	" "
13. S.	2,6,12	+	+	" "	+	+	Few Colonies.
14. T.	3,9	+	+	Protargol 2%	+	—	Gonococci killed.
15. E.	3,9	+	+	" "	+	—	" "
16. T.	3,12	+	+	" "	+	—	" "
17. B.	3,12	+	+	" "	+	+	Few Colonies.
18. B.	9,27,11	+	+	Cal. Oint. 30% Lanolin	+	+	Gonococci not killed.
19. P.	10,2	+	+	" "	+	+	" "
20. G.	1,12,12	+	+	Cal. Oint. New.	+	+	" "
21. S.	10,12,11	+	+	Carb. 3% Lanolin	+	+	" "
22. G.	11,10,11	+	+	" " "	+	+	" "
23. J.	1,17,12	+	+	" " (New)	+	+	" "
24. B.	2,10	+	+	A. & N. (New)	+	+	" "
25. G.	2,10	+	+	" "	+	+	" "

surface and lose itself like the first ointment. Thinking that possibly the method of preparation had something to do with this sticky character, we had Parke, Davis & Co., who made the original tubes, make us the separate ointments by passing them through a paint mill. These ointments resembled ours in consistence and the results were equally unsatisfactory.

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About this time we received a second set of A. & N. packets whose contents were entirely different from the first in odor, color and consistence, but looked and acted exactly like our separate ingredient ointments; in addition they failed completely as gonococcocides. We were somewhat at a loss to understand the situation and finally wrote to Parke, Davis & Co., stating the findings. They then replied that the earlier A. & N. packets had been made with a different formula, viz:

Camphor	3
Phenol	3
Calomel	25
Lanolin	25
Rendered Lard q. s.	100

This, then, was the true formula of the early and effective ointment, and it is easy to see that the camphor and lard both help to spread the carbolic acid closely over the surfaces and thus to bring it into action. In short, the early A. & N. packets were effective on account of their physical and chemical properties. The packet later issued, without the camphor and lard, is worthless according to our experiments.

As argyrol and protargol have been used as prophylactics, we tested them in the same way, and found that argyrol 10% was effective in 4 out of 5 instances, and protargol 2% in 3 out of 4 instances. In the cases where these solutions failed the discharge was very rich and a few colonies of gonococci grew in spite of the application. 100% of success could hardly be expected, and it is clear that these silver salts have a gonococcocidal action. In view of various criticisms (Journal American Medical Association, Chicago, Nov. 5, 1910, and July 29, 1911,—Circular, Headquarters Central Division, Chicago, August 15, 1911), of the silver salts in this connection, it is suggested that the action of these salts in contact with organic material, as in the urethra, is different from their action in test tube experiments.

In the course of this work 34 infected men were questioned about the use of prophylactics; 27 used no K packets; 7 used Argyrol K packets; and 2 of the 7 apparently used them properly; 4 used the hospital prophylactic treatment of argyrol and still were infected 2, 3, and 6 hours after exposure. Almost all

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the men washed themselves and many used bichloride. Among the reasons given for not using a K packet were as follows: one man had never heard of them; one man was drunk; a number of men had them in their lockers, but did not anticipate the necessity for using them; one man found his K packet empty. One interesting case was seen of a man with two chancres at the base of the penis, who had used the calomel ointment, but only on the head of the penis.

Conclusions: the original A. & N. packet is effective as a prophylactic, probably on account of its content of carbolic acid, which is brought into action by the camphor and lard. The later A. & N. packet is *not* effective according to our experience, on account of its sticky character which prevents its spreading over the mucosa. Argyrol and protargol are effective in a majority of instances.

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CURRENT LITERATURE

Titles marked with an asterisk (*) are abstracted below.

FRANCE.

Archives de Médecine et de Pharmacie Militaires.

May, 1912.

1 Study of the Association of Scarlet Fever and Smallpox. Talon.
2 *Septicaemia Due to Staphylococci. Uffoltz.
3 Subserous Appendectomy. Pafon.
4 False Circumscribed Aneurysm of the Left Axillary Region. Boppe.
5 Function of the Medical Service at the Battle of Moul-el-Bacha. P. Saletes.

June, 1912.

6 Lesions of the Semilunar Cartilages of the Knee and Their Treatment. Gary.
7 Suicide by Blow of a Blank Cartridge in the Abdomen. Galzin and Chevion.
8 Mobile Tent for Dressing Station. Montagne.
9 Commercial Hydroscopic Cottons. Jalade.
10 Medical Service of the French Army and the Evacuations by Water, 1743-1832. Ferron.

2. **Septicaemia Due to Staphylococci.**—A young soldier was admitted for lameness and soon developed several painful joints and ran a septic temperature. No focus of infection could be found, and a blood culture was negative. A second blood culture showed the presence of staphylococcus aureus and this finding was confirmed by two other cultures. The fever ran for six weeks uninfluenced by quinine, collargol, and salicylates. A vaccine was made and a dose of 40 millions was given; no reaction and no effect on the disease. Three days later 100 millions were given and the disease was at first aggravated and then ended with a critical sweat and urination. The author believes the vaccine cured the case.

H. J. NICHOLS.

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Archives de Médecine et Pharmacie Navales.

May, 1912.

11 Vaccination Against Typhoid Fever. Dr. Liffran.
12 Notes on Tuberculosis at Indret. Dr. Fossard.
13 On the Method of Precipitating Urinary Albumen by Double Iodide of Potash and Mercury. M. Vallery.
14 *Notes on the Second Congress of Tropical Medicine, Held at Hong-Kong, January, 1912. Dr. Ratel.

14. **Notes on the Second Congress of Tropical Medicine.**—We extract as follows from this interesting paper: "It is recognized that rice plays a capital role in the appearance of beriberi. Under the influence of fermentation there develops in this substance a septic anaerobic vibrio; hulled rice ferments more readily than the unhulled, and also it is more berigenic than the second. In the organism the vibrio develops equally under the influence of intestinal fermentation, but is not fatal in individuals who do not make rice their sole nutriment. Rice is lacking essentially in phosphorous, and arguing from this fact it was proposed at the Congress of Tropical Medicine, held at Manila in 1912, to add this element to rice, hoping thereby to arrest the development of beriberi; but the results were unsatisfactory and it was found that to arrest this malady rice must be given with other alimentary substances, particularly the meat of pork, fish, fresh vegetables (especially beans). Dr. Bréaudat (of the Pasteur Institute, Saigon) spoke of the polyneuritis of chickens and of the excellent results obtained with these animals nourished by rice exclusively attacked with polyneuritis through the administration of nucleins and nucleo-albumin.

Amoebic Dysentery.—The surgical treatment of this disease was discussed, consisting in an appendicostomy or caecostomy; that is to say, an operation to bring the appendix, or caecum, through an abdominal incision and confine it to the integument so as to permit of active antiseptic irrigation of the bowel. Dr. Muller, of Hong-Kong, the author of this method, announced the cure of several chronic cases in this way when all medical treatment had failed.

JOHN C. WISE.

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GERMANY.

Deutsche Militärärztliche Zeitschrift.

May 5, 1912.

15 *Examination of the Recruits of the Second Army Corps for Typhoid Bacillus Carriers. Hüne.
16 A Review of Foreign Bodies Found in Prisoners. E. Mangelsdorf.
17 The Significance of Blood Cultures in the Diagnosis of Febrile Disease. Broese.
18 Medical Statistics of the Prussian Army. Hetsch.
19 Free Transplantation. F. Brüning.

May 20, 1912.

20 On Malingering. Dannehl.
21 Contribution to Treatment by Steinmann's Nail-Extension. Eltester.
22 On the Arrangement of X-Ray Pictures. Glogan.
23 A New Tuning Fork. Dölger.
24 A New Steam Sterilizer. Albers.
25 The Treatment of Inflammation of the Lungs. Ferber.

June 5, 1912.

26 Observations on Alcoholic Delinquents. Becker.
27 The Ear and Swimming Practice. Dannehl.
28 *Spirochaetae of Men and Animals in the Tropics. P. Mühlens.

15. **Examination of Recruits for Typhoid Bacillus Carriers.**—Hüne has continued the work previously reported in this journal, April, 1911, and has covered the recruits for the entire army corps. Four hundred and fifty-seven men were examined. These had either had typhoid themselves or had been in contact with typhoid cases at their homes or places of work. Agglutinations were done in all cases and three urine and stool examinations at eight-day intervals on all men who had had typhoid or had been exposed within a year. The work required a long time as the author had no expert assistance. The results were the discovery of two typhoid carriers, two paratyphoid carriers, and eight men who agglutinated over 1-20. Agglutination was of no aid in finding the carriers. The two typhoid carriers were discharged. The others were kept under observation.

The author believes that agglutination is not feasible for general use, but recommends examination of the stools and urine of all recruits who have had typhoid in the last two years, or have

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been exposed in the last six months. This would mean the examination of about sixty men for the Second Army Corps, and this work could be done by one man in four weeks if he could devote the mornings to it.

28. **Spirochaetae of Men and Animals in the Tropics.**—Spirochaetae play an important role in tropical pathology. 1. Spirochaetae in the human blood stream—relapsing fever. Opinion is still divided about the method of division and the existence of resistant forms and granules. Morphologically the organisms are much alike, but by inoculation and immunity experiments they can be divided into five varieties: sp. Obermeieri, Duttoni, Berbera, Novyi, and Carteri. Mühlens reviews our knowledge of each disease. 2. Spirochaetae in the blood of animals; spirochaetae in fowls, cattle, horses, sheep, apes, mice, rats, etc. 3. Spirochaetae in human skin lesions—yaws and syphilis. Sp. pertenuis has been grown in pure culture by Noguchi; Salvarsan is an ideal specific. Sp. Schaudinni and fusiform bacilli are found in tropical ulcers as in Vincent's angina. Sp. aboriginales has been described in venereal granuloma. 4. Spirochaetae in other human affections; tumors, gangrene of lung, diarrhoea, bronchitis, etc. 5. Spirochaetae in other animal diseases; swine and insects. In animals only fowl spirochaetae is of pathological significance.

H. J. NICHOLS.

GREAT BRITAIN.

Journal of the Royal Medical Corps.

June, 1912.

29 The Papataci Flies (Phlebotomus) of the Maltese Islands. R. Newstead, M. Sc., A. L. S., etc.

30 Note on the Bacteriological Examination of Indian Water Supplies. Major R. W. Clements, R. A. M. C.

31 Mushrooms—Their Identification and Effects. Colonel R. H. Firth, R. A. M. C.

32 Practical Hints on Marching and Health on Active Service. G. Fahey.

33 The Medical Service with Lord Methuen's Force During the Advance on Kimberley, 1899. Lieut. Col. C. H. Burtchaell, R. A. M. C.

ALBERT G. LOVE.

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SPAIN.

Revista de Sanidad Militar.

June 1, 1912.

34 A New Table of Exemptions Connected With the Law of Recruiting—Its Practical Results. Julio Martin.

35 *Concerning the Febrile Reaction from Injections of 606. Manuel Inigo.

36 Importance of Hematuria in Serious Contusions of the Kidney. Rafael Ramirez Rivas.

35. **Concerning the Febrile Reaction From Injections of 606.**—This article reviews the work of Wechselmann and of MacIntosh, Fildes, and Deardeau, and concludes that it is definitely established that the febrile reaction following the injection of salvarsan is due to the presence of bacteria in the fluid used in the injection of the remedy. The writer believes that Jakimoff has shown by experiments on animals that salvarsan is more toxic when injected in the usual germ containing medium than when absolutely germ-free water is used. His conclusions are that salvarsan should always be injected free not only from living bacteria, but also from dead ones, which are toxic in spite of sterilization; that only recently distilled water, collected and kept aseptically, is to be used as a vehicle for the administration of salvarsan; and that if this is done it is possible to administer 606 even to those so sick that its use would be otherwise contraindicated.

June 15, 1912.

37 *The Antituberculosis Campaign in the Army and Navy. F. Gonzalez Deleito.

38 Localization of Foreign Bodies. (Localizacion de los cuerpos extraños en organismo humano). Bartolomé Navarro Cánovas.

37. **The Antituberculosis Campaign in the Army and Navy.**—The author states that the Spanish Army is among those having the highest rate of tuberculosis, the total of those treated in the hospitals being surpassed only by the French and the Swedish Armies. He accounts for this on the grounds that insufficient statistics caused the prevalence of the disease to remain hidden, and thus deferred the campaign against it until a very recent date;

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and also that the diagnosis of tuberculosis in the Spanish Army is probably applied to many suspicious cases, which would be elsewhere diagnosed as bronchitis, pleurisy, etc.

Statistics are quoted to show that the incidence of tuberculosis in the army follows very closely that of the civil population, the greatest number of cases of the disease being found among recruits from areas of population which have the highest rates of tuberculosis. Tables are also given to show that the incidence of the disease is much greater during the first year, and even the first few months of military service than at any later time, seeming to prove that tuberculosis is not often acquired in the service, but is usually brought in from outside. This corresponds to the experience of other armies.

By institution of the usual sanitary measures and by greater strictness in recruiting the rate of incidence of the disease is being gradually, but markedly, lowered.

A. C. CHRISTIE.

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REVIEWS

DUODENAL ULCER. By B. G. A. Moynihan, M. S. (London), F. R. C. S., Senior Assistant Surgeon at Leeds General Infirmary, England. Second edition, enlarged. Octavo of 486 pages, illustrated. Philadelphia and London; W. B. Saunders Company, 1912. Cloth, $5.00 net; Half Morocco, $6.50 net.

The first edition of this well-known work was reviewed in these pages but a short time ago. As was stated at that time, the author's name has been so closely identified with his present subject that anything he writes thereon is received as authoritative and is in consequence read all over the world. It is evident from the promptness with which the second edition has appeared that Mr. Moynihan has found many appreciative students of his valuable book.

The changes in the text of the second edition have been chiefly in the differential diagnosis of duodenal ulcer and the result of x-ray examinations of the stomach after the administration of bismuth. Cases operated on during the year 1909 and 1910 have been placed in a second appendix. This is interesting as it gives an opportunity to contrast earlier and later experiences. In the latter series 115 cases are included on whom 116 operations have been performed. In the last case 305, an extremely unfavorable one, death occurred. One hundred and ninety-two cases had previously been operated without a death. In the new series the number of deaths was one, or .87%; in the combined series of all cases five deaths occurred, a percentage of 1.65. The cures effected in the new cases numbered 102, 88.7%, as contrasted with 250 cured, 82.78%, for all cases operated.

HARELIP AND CLEFT PALATE. With Special Reference to the Operative Treatment and Its Results. By James Berry, B. S. (Lond.), F. R. C. S., Senior Surgeon to the Royal Free Hospital, London, Consulting Surgeon to the Alexandra Hospital for Children with Hip Disease, and T. Percy Legg, M. S. (Lond.), F. R. C. S., Surgeon to the Royal Free Hospital, London, Assistant Surgeon to King's College Hospital. Two hundred and forty-two figures and appendix of cases of operation for cleft palate. Octavo of 324 pages. Philadelphia: P. Blakiston's Son & Co., 1912. Price, $4.00 net.

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This is an excellent book. The development of the lips and palate is first described; then chapters follow in order as follows: Anatomy and Physiology of the Lips and Palate, Varieties of Harelip and Cleft Palate, The Functional Results of Cleft Palate, Treatment of Harelip, Secondary Operations for Harelip, Treatment of Cleft Palate, After-treatment and Complications of Operations for Cleft Palate; Training in Articulation, Secondary Operations for Cleft Palate, Displacement of Teeth; Treatment; Other Operations for Cleft Palate, and On Obturators and Artificial Vela. One appendix is devoted to charts showing two pedigrees of cleft palate patients and two to the results of 166 operations on cleft palate.

The book is well arranged; is written in a convincing style and is splendidly and profusely illustrated.

COMPENDIUM OF DISEASES OF THE SKIN. Based on an Analysis of Thirty Thousand Consecutive Cases with a Therapeutic Formulary. By L. Duncan Bulkley, A. M., M. D., Physician to the New York Skin and Cancer Hospital; Consulting Physician to the New York Hospital; Consulting Dermatologist to the Randall's Island Hospital, to the Hospital for Ruptured and Crippled, and to the Manhattan Eye and Ear Hospital, etc. Fifth Revised Edition of the Manual of Diseases of the Skin. New York: Paul B. Hoeber, 1912. Price, $2.00 net.

The first edition of this manual appeared thirty years ago and was prepared mainly for practitioners attending the author's lectures at the New York Hospital. Then, as now, the manual was intended as an introduction to the subject of dermatology.

The last previous edition was published fourteen years ago and as much progress has been made in the interval in the subject of which the book treats considerable changes in the text have been found necessary, but this edition is not notably enlarged. This is due to the fact that descriptions of rare diseases have been omitted as of scant value to the practitioner. The book is still a personal one and represents the substance of lectures delivered annually for many years past at the New York Skin and Cancer Hospital.

BABY'S TEETH TO THE TWELFTH YEAR. By Albert Westlake, D.D.S. Octavo of thirty-five pages. New York & London: Mitchell Kennerley, 1912. Price, 50cts.

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This is a small book, yet apparently it has been necessary to go rather far afield in order to get together sufficient material to make it up.

Doubtless, the purpose of the author is excellent. Prevention of diseases of the teeth is not the least in importance so far as prevention of diseases is concerned. In the last analysis, however, in so far as diseases of the teeth are affected by the general condition of the body this should rather be left to the attending physician. While the author has been very careful to mention the importance of following the advice of the physician, in certain instances he has given strictly medical advice of doubtful value, certainly not of universal application.

THE PRACTICAL MEDICINE SERIES. Comprising ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School.

VOLUME II. GENERAL SURGERY. Edited by John B. Murphy, A. M., M. D., LL. D., Professor of Surgery in the Northwestern University, Attending Surgeon and Chief of Staff of Mercy Hospital, Wesley Hospital, St. Joseph's Hospital and Columbus Hospital, Consulting Surgeon to Cook County Hospital and Alexian Brothers' Hospital, Chicago, Illinois. Series of 1912. Octavo of 616 pages, illustrated. Price, $2.00. Price of the series of ten volumes, $10.00. The Year Book Publishers, Chicago, Illinois.

In this series the volume on general surgery which is edited by Dr. John B. Murphy annually is perhaps the most generally popular volume of the year. As is always the case this volume contains an excellent review of the surgery for the year and according to his usual practice Dr. Murphy has made comments throughout the book which add notably to its worth.

Dr. Murphy, in the present volume, has written a brief introduction in which he comments on matters for the year which appear of special importance to him. In this he notes that surgical technic is rapidly becoming standardized throughout the world and that the immediate management of fresh wounds is becoming that of non-interference except for the mechanical removal of traumatized infected zones. He mentions the tendency to plate

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simple fractures but states that no foreign body should be used to mobilize compound fractures. He also favors ether as an anaesthetic. Dr. Murphy refers to the growth of tissue in culture media as a real achievement and gives as his opinion that vaccines are only beginning to be appreciated. Further allusions are made to recent work in cancer, to Moorhof's iodoform bone-plug, to arterial suture, etc.

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The high standard established by this quarterly is maintained in the present number. There are, however, not many articles of special interest to the service medical officer as such. Among those of greater importance to him are the following: Kerosene as a Remedial Agent in Dysentery, The Modern Treatment of Syphilis, Modern Instruments of Precision in the Study of Cardiovascular Disease, and The Operation for the Radical Cure of Inguinal Hernia with Local Anaesthesia.

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EDITORIAL

WITH the great progress that has been made in sanitation during the past few years and the general freedom with which sanitary questions are now discussed it would seem as though the public would have a fairly correct idea of what modern sanitation really is. It is true that from time to time we see the most extraordinary misstatements on this subject in the public press, yet we pass them over without much consideration of the appalling ignorance they reveal until some particularly flagrant mistake brings us up all standing. One of these has recently attracted our attention. In discussing the detail of a medical officer of one of the public services as sanitary adviser to a South American country an article appeared in one of our prominent daily papers which was headed: "American Sewers for South America." In an apparently serious tone the value of the American sewer was pointed out and the South American country in question was congratulated on its wisdom in securing the benefits from this sewer through the detail mentioned.

Shades of our illustrious predecessors! The modern sanitarian is no longer a plumber. Doubtless the services of the medical officer referred to will be of the greatest value, perhaps too he will have some sewers dug, certainly he will if they are needed. Whether they are American sewers or not matters little, nor is it understood in what particular our sewers are superior to all others.

It may be fairly concluded from occurrences of this character that there is something very wrong in our methods of imparting knowledge of sanitation to the American public. In our larger cities, the citizen is fairly well protected against most contagious diseases. But it is not uncommon for him to pick up typhoid fever on his summer vacation and, as a matter of fact, if he can commit any sanitary sin he is almost certain to do so through ignorance. Even those who are most impressed with the danger of germs are constantly neglecting the essential and insisting on the non-essential. It is fair to presume that the sewer man

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would be horrified by a bad smell and would willingly and eagerly swallow millions of bacteria in a clear water. Yes, it is practically certain.

Modern sanitation has without question notably reduced our death and morbidity rates. Statistics prove this and in this case statistics surely do not lie. Having gone so far, is it not possible to go much further? Added to the many excellent safeguards for diminishing diseases in force today if our children and youths were really taught how to protect their own health, morbidity and mortality rates which are now regarded as excellent would make quite another showing. It is, of course, realized that considerable progress is being made in the direction suggested, but every one must admit that a good deal more could be done, and it is a matter of common knowledge that the results accomplished by present methods of education leave a great deal to be desired.

It is believed that physicians should take a much larger part in public instruction in sanitation. They, by education and training, are alone fitted to teach this subject in its entirety. Now, conditions are such that, generally speaking, everyone except the physician gives this instruction. That is to say, so far as the routine teaching is concerned which is what counts, and it is very likely that it is from this cause that the results are poor so far as preparing the public to protect its own health are concerned. It is realized that there are many difficulties in the way of procuring physicians to give such instruction and that many physicians who are excellent representatives of their profession are not qualified to teach elementary sanitation. If, however, and this is universally admitted, our mission before all else is humanitarian, should we not give a little time in our medical schools to teaching our future physicians how to teach personal hygiene? After graduation in the early years of practice the doctor's time is not usually so freely occupied that he would be prevented from giving even as much as seven hours a week to teaching hygiene in our schools. This must result in great good to the public and it will serve to put the medical profession in its proper position as the teacher of a subject on which alone it has competent knowledge.

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CORRESPONDENCE.

The following letter is published in order to express the views set forth from a Red Cross standpoint:

To the Editor:

In the encyclopedic article on Military Absenteeism, which was concluded in the July issue of the MILITARY SURGEON, Major Munson devotes about a page to voluntary aid personnel, and expresses the belief that volunteer societies should not be given control of independent sanitary institutions, as their agents and representatives are apt to become, innocently, to be sure, the victims of crafty claimants for unmerited discharges, furloughs, etc.

In as much as under Presidential Proclamation the American Red Cross is the only volunteer body authorized to assist the sanitary forces of the Army and Navy with personnel and matériel in time of war, I take it that Major Munson's remarks apply to just such a corps, which I have the honor to represent.

While I do not consider myself a mere civilian surgeon, I hesitate to make reply to so eminent a leader in medical organization work as is Major Munson. I am also handicapped by the fact that the trained male sanitary personnel of the Red Cross has for the past four years become organized, trained and equipped under a tentative program, which is about to be given a definite form by the proper authorities. In spite of all this I feel that a few remarks on this theme may not be without interest to medical officers of the military services.

I can well see the justice of Major Munson's demands when we consider recent experiences with Red Cross activities in the Russo-Japanese War. The Russian Red Cross, undoubtedly, has done professionally much good work, but its usefulness as an organization became greatly impaired because instead of subordinating itself to the Army medical service it insisted on a certain autonomy and frontal activity. In the beginning of the war the limited medical personnel of the army in Manchuria had to welcome any trained addition, but as soon as conditions improved the Red Cross "flying detachments," hospital trains, field and base hospitals were assigned for rear-zone activities, where they properly belonged. Only after a certain degree of harmonious

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coöperation had been achieved did both Army medical corps and Red Cross work in satisfactory unison.

While all this presents a lesson of great import to all civilized armies, conditions in the United States differ so much from those in Continental armies, that our whole scheme of voluntary aid must be viewed from an entirely different angle.

In the first place the medical corps of the regular Army and National Guard is not elastic enough for a real contingency. True, we have a so-called inactive medical reserve corps, the members of which leave nothing to be desired professionally. But just because these gentlemen are professional men only, and not trained medical officers, their usefulness will be limited as consulting or attending specialists to larger institutions in the rear of the fighting lines. It must not be forgotten that the list is a small one, that since its organization about half a dozen have died already, that many are not in the prime of life and that not all can be depended upon to respond to a call.

It is evident that a properly organized Red Cross sanitary corps will prove of immense value in time of need.

But in order to become useful such a corps which will be expected to conduct or assist in base hospitals, hospital ships and trains, or to act as transport columns, etc., must be organized along strictly military lines.

I believe I betray no official confidences that Major Lynch, who is in charge of such Red Cross corps, and Major Straub who, as a General Staff officer, has drafted a definite scheme of Red Cross field organization, both agree with the above proposition.

It has been my good fortune to train here in Chicago over three hundred officers and men for such work. I am sure Major Munson will be pleased to learn that this training has been as closely as is possible to that prescribed for the regular hospital corps. The few medical officers connected with the corps are thoroughly conversant with military hygiene, law, sanitation and the customs of the service. Laymen, who, under our regulations, can command small detachments, have been especially trained for such work, will make better officers than the line officers in Continental armies assigned to command sanitary troops. They are not medical men, but know outside of first aid their duties

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well. Some have shown especial aptitude as supply officers, adjutants and the like.

The psychology of American youth is such that something strictly military is needed to enthuse him for the service and to make him stick to it after enlistment. That great indefinable force, commonly described as discipline, is essential for success. Discipline without military status and without the backing of higher authority becomes a farce.

If the Red Cross is to attract first-class medical men and representatives of the better class of citizens for service in the field it will have to offer them a status second only to that of the Army medical and hospital corps.

Under such a status, knowing its own limitations, it can be depended upon to transact whatever business may be given it by the proper military authorities with care. Nor will there be need of fear to entrust them with the autonomous management of their own institutions, *subject to control and inspections* by the chief surgeon of the lines of communication.

Very respectfully,

(Signed) GUSTAVUS M. BLECH,
Director, Ill. Div. American Red Cross Field Corps.

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NEWS OF THE SERVICES

Lieutenant Colonel Jefferson R. Kean, Medical Corps, U. S. A., requests that the following correction be published:

"In an article published in THE MILITARY SURGEON for March, 1912, entitled 'The Venereal Problem in the Army and Navy,' I made a quotation in a footnote from a footnote of an article by Colonel John VanR. Hoff, published in THE MILITARY SURGEON, Vol. 25, page 733, entitled 'Is There a Venereal Peril for Us?' This note stated that 'The distinction between chancroid and syphilis began to be recognized in our Army about 1880, the exact date being unknown to the author. In the British Army the distinction was not recognized until 1887.' An examination of the old reports of the Surgeon General, U. S. Army, shows that this statement does great injustice to the diagnostic ability of the Army surgeons of the first half of the last century. Beginning with 1840, a separate heading appears in the tabulated statistical reports entitled 'Ulcus Penis, non syphiliticum.' While the number of admissions under this heading is not very large, it shows that a certain number at least of the military surgeons appreciated at that time the fact that they were dealing with a local infection, not syphilitic in character."

The trustees of the American Medicine Gold Medal Award announce that the medal for 1912 has been conferred upon Doctor William C. Gorgas, Ancon, Panama, as the American physician who, in their judgment, has performed the most conspicuous and noteworthy service in the domain of medicine during the past year.

Lieutenant Colonel Jefferson R. Kean, Medical Corps, U. S. A., read a paper entitled "The Tribute to the Minotaur" before the Society of Social Hygiene of Maryland, at Baltimore, April 17, 1912.

Major Paul F. Straub, General Staff, is spending a leave of absence at Dubuque, Iowa. Major Straub will sail for the Philippines in September, 1912.

Major William E. Purviance, who has recently been in the city for examination for promotion, has been found physically incapacitated for service and will be placed on the retired list with the rank of lieutenant colonel, August 5, 1912.

Major George D. Deshon has recently been in Washington under official orders.

Lieutenant Colonel Francis A. Winter has been spending a leave of absence at Broad Run, Va.

Field Hospital No. 3, from the Walter Reed General Hospital, has been ordered to the Eastern Division for duty during the maneuvers. The

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first section, under command of Captain William A. Wickline, is at Mount Gretna, Pa., and the second section under the command of Captain William L. Little, is at Anniston, Ala.

Captain Jay W. Grissinger reported for duty at the Soldiers' Home on June 29th.

Fifty-one candidates have been invited to report for preliminary examination for appointment in the Medical Corps of the Army, at the various Army posts throughout the country and at Ancon, Panama, on July 15, 1912. There are at present sixteen completed applications for the examination to be held September 3, 1912.

Lieutenant Colonel Jefferson R. Kean, Major F. F. Russell, and Lieutenant Frederick H. Foucar returned to Washington from Porto Rico July 15th.

Captain Lloyd L. Smith recently reported for duty at the Walter Reed General Hospital.

Captain George P. Peed is on temporary duty at Fort Thomas, Kentucky, and detached service from Fort Monroe.

Majors Henry Page, L. T. Hess, Paul C. Hutton, and H. H. Rutherford, and Captain Howard H. Baily are at maneuver camp, Mount Gretna, Pa.

Captain George F. Juenemann left Fort Logan, Colo., July 5th on a two months' and fourteen days' leave of absence.

First Lieutenant Edgar C. Jones has reported at Fort Des Moines, Iowa, from Fort Liscum, Alaska.

Major H. S. Greenleaf has reported for duty at the U. S. Military Prison, Alcatraz Island, Cal., from Madison Barracks.

First Lieut. Henry Beeuwkes has reported for duty with Ambulance Company No. 2 at the Presidio of San Francisco, Cal.

Major Arthur W. Morse has been granted a four months' leave of absence which he will spend abroad.

Captain Robert C. Loving has been relieved from duty in the Philippines Division and assigned to duty as surgeon on the U. S. A. T. "Thomas" with station at San Francisco, Cal.

First Lieut. John F. Leeper, Medical Reserve Corps, has returned to the United States from Honolulu on a three months' leave of absence, on the expiration of which he will be honorably discharged from the service.

Colonel Charles Richard has been assigned to duty as instructor in military surgery at the Army Medical School in Washington.

The resignation of First Lieutenant J. Marchal Wheate, Medical Reserve Corps, has been accepted to take effect September 8, 1912.

Major Gideon McD. Van Poole returned to Fort Washington, Maryland, July 8th, from leave of absence.

Doctor Robert Henry Duenner, of Washington, D. C., passed the preliminary examination for appointment in the Medical Corps of the Army, held at Washington, D. C., on June 10, 1912. Doctor Duenner was born

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at Knoxville, Tenn., January 4, 1883; he was graduated from the George Washington University, Medical Department, in 1910. He was an interne in the George Washington Hospital, Washington, D. C., for one year. He will be brought to the Army Medical School in October, 1912.

Doctor Ernest Chester McCulloch, of Cincinnati, Ohio, passed the preliminary examination for appointment in the Medical Corps of the Army, held at Fort Sheridan, Illinois, on June 10, 1912. He was graduated from the Miami Medical College, Cincinnati, Ohio, in 1910. He was for ten months interne in the National Jewish Hospital for Consumptives, Denver, Colo., and served one year as interne in Christ Hospital, Cincinnati, Ohio. He will be brought to the Army Medical School in October, 1912.

Assistant Surgeon R. A. Kearney, of the Public Health and Marine-Hospital Service, has been relieved from duty on the Revenue-Cutter "Rush" and detailed for temporary duty at the Bureau in Washington.

Passed Assistant Surgeon L. L. Lumsden, of the Public Health and Marine-Hospital Service, is at the present time conducting investigations into the prevalence of typhoid fever in the rural districts of Virginia. This work is being carried on in cooperation with the State Board of Health.

Upon the request of the Governor of Porto Rico, the Public Health and Marine-Hospital Service is cooperating with the Porto Rican Department of Sanitation in the eradication of plague in Porto Rico. Passed Assistant Surgeon R. H. Creel, of the Public Health and Marine-Hospital Service, has been placed in charge of the work. Assisting him are Assistant Surgeons C. L. Williams and J. R. Ridlon. Up to July 15 there was a total of 37 cases of plague with 23 deaths in the island. Most of these cases were in San Juan. Cases have occurred, however, at Carolina and Dorado. One case also occurred on a vessel at Arroyo. The work of plague control and eradication is well under way. Especial attention is being given to the control of the disease in rodents, as the rodent infection is the important factor in the spread of the disease. Rats are being trapped and collected in other ways and examined for the presence of plague. This is done to ascertain the location of infection among rodents that special measures may be taken in the areas thus found to be infected. General measures of deratization to diminish in so far as possible the number of rats are also being carried on. These include poisoning of rats, rat-proofing of buildings, and scrupulous attention to the care and disposal of garbage and other materials which may serve as rat food.

Passed Assistant Surgeon R. H. von Ezdorf, of the Public Health and Marine-Hospital Service, has been detailed to Habana in connection with the occurrence of plague there. Doctor von Ezdorf's duties will be mainly in connection with the issuing of bills of health to vessels leaving Habana destined for ports in the United States, together with the supervision of the shipping of freight and the embarkation of passengers on these vessels. Only two cases of plague have occurred in Habana to July 15.

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Because of the occurrence of plague in Porto Rico and Habana, the Surgeon General of the Public Health and Marine-Hospital Service has instructed officers of that service stationed in cities on the Atlantic and Gulf seaboards to confer with the city health authorities and urge the immediate inauguration of work for the destruction and examination of rats on the waterfront. This work has already been begun in the cities of Galveston, Norfolk, and New Orleans. Other cities are making arrangements to take up the work.

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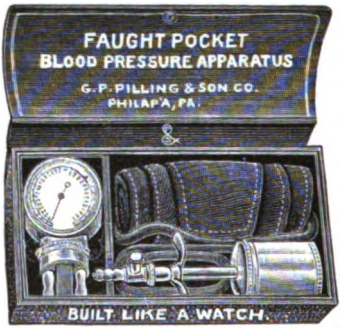

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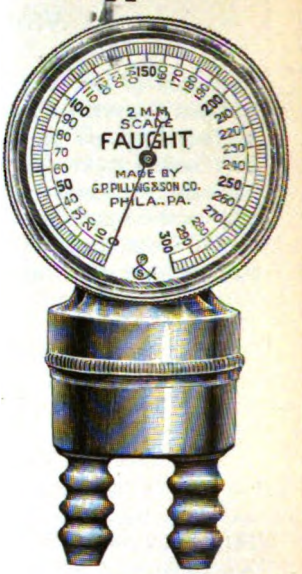

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The Military Surgeon

Vol. XXXI. SEPTEMBER, 1912 No. 3

ORIGINAL ARTICLES.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS EXPRESSED IN THEIR CONTRIBUTIONS.

WHAT ARE THE BEST AVAILABLE MEASURES TO DIMINISH VENEREAL DISEASES AMONG SOLDIERS AND SAILORS, AND ALONG WHAT LINES SHOULD WE SEEK THE CO-OPERATION OF FEDERAL, STATE AND MUNICIPAL AUTHORITIES?

BY SURGEON FRED M. BOGAN, U. S. NAVY.

INTRODUCTION.

DURING the past ten years perhaps no subject has engaged the attention of the medical officers of the Army and Navy and of various municipal, state, and philanthropic bodies to so great a degree as the question of venereal diseases, their extent, and the various schemes suggested for their control. Many people are pessimistic as to our ability to do anything to better conditions, even admitting them to be as bad as they are. It has been my endeavor in the present paper to show just what the present status of venereal diseases is. To show that what many people hold to be impossible, i. e., state and municipal recognition, has already taken place, that what many have regarded as strictly a military problem is a national one, and that reduction of venereal diseases in the Army and Navy very largely depends on the preliminary education of children many years before it is possi-

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ble for them to enlist in a military force. It has also been my aim to show that compulsory venereal prophylaxis is perfectly feasible, that men when they understand it do not object to the treatment, that it is very largely in use in the Navy at the present time and that no additional authority is needed by commanding officers to punish offenders who neglect to take the protection afforded by this treatment. The treatment now in force in the Army and Navy does protect when taken within a reasonable time, but there will always be a number of incorrigibles who laugh at protection of any kind and break all rules of no matter what nature. One of the most potent arguments of the layman against any measures looking to the prevention of venereal diseases has been that if we eliminate danger we encourage vice, i. e., that many who refrain from illicit intercourse because they know of the general prevalence of venereal diseases among prostitutes, would not so refrain if they are assured of a preventive against these diseases. The only statistics that we have on this point are from the Asiatic Station where the fleet surgeon of that fleet states "that the number of men who deny exposure has, since the inception of this treatment, been constantly on the increase. The prominence given to the question of venereal disease by commanding and medical officers, the talks on personal hygiene, the institution of the prophylactic scheme in itself, have, in the writer's opinion, been beneficial by bringing the better class of men to a greater realization of the evils frequently resulting from exposure, and by stimulating a latent moral sense. In any event there is no reason to think that a sense of security engendered by the scheme has caused any increase in indulgence."[1] In our lectures on this subject, men are urged not to take the chances involved by having sexual intercourse with prostitutes. And certainly any one who has strength of mind sufficient to enable him to abstain from illicit sexual intercourse because he knows of the danger involved, will hardly be likely to rush into it because a preventive is offered, for at the same time we are telling him of the filthy mess that prostitution is and urging continence. "It was said of a great nation recently engaged in war, that its men required no further teaching in patriotism or discipline when they entered the service, and that

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thereby the period for effective training was much shortened, and the result was a much better soldier."[2] It is also said that when a surgeon general of this same nation was asked as to the manner of disposing of venereal disease in their Army he replied, "We do not have any venereal problem—our men are ordered not to have sexual intercourse except with their wives, and they obey orders." This illustrates the ideal condition in a military force, i. e., obedience to orders of whatever nature. Shall we ever attain it? We can safely answer no. The independence of thought and action which our Constitution guarantees every citizen are instruments which are more or less detrimental to discipline. "Theirs not to reason why—theirs but to do or die," is certainly not the attitude of the average recruit of the present day. He wants to know why, and so far as sexual hygiene is concerned the best time to teach him is when he is a small boy. In discussing a subject of such vast importance as the proper measures to diminish venereal diseases among soldiers and sailors we must first of all recognize the fact that while the military genius is probably born as such, our recruits are born babies and later on by accident or choice become soldiers or sailors. The average age of our recruits in the Navy is about twenty-one years and recent statistics show that one-half of the total of the enlisted force of the Army is under twenty-five years.[3] It is probable that only the stimulus of actual war itself can attract more mature men to enlist in the lower grades. With the bulk of our enlisted force so young, and the knowledge that venereal disease is greater among young adults than those of middle age, it is very evident that efforts for enlightenment of children in sexual hygiene, will in a few years give us many recruits who have had this preliminary instruction and who should be better able to understand the dangers of illicit venery and more willing to abstain from it.

GENERAL EDUCATION OF THE PUBLIC IN SEXUAL HYGIENE.

We are beginning to realize that education, or rather popular information about disease, is the most effective and available weapon of sanitary science. Preventive medicine is powerless against ignorance and stupidity. Schools, newspapers, lectures,

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bulletins and exhibits have their place, but a real comprehension of the principles which underlie our work is necessary. Sexual education to be effective must commence with the child when the "mind is receptive for what is clean, honest and true." The early knowledge of sex hygiene enables the child to later on understand the influences and desires which follow in his development. It may be asked who is to give this early instruction to young children? If properly qualified no one can give it so well as the mother. Already thirteen state societies have been formed for the purpose of giving this instruction and are sending out literature written to appeal to those of both sexes and different ages. The pamphlets prepared under the direction of Dr. Prince A. Morrow for the American Society of Moral Prophylaxis of New York are excellent examples of this literature. The series includes, 1. The Young Man's Problem; 2. For Teachers; 3. The Relation of Social Diseases with Marriage and Their Prophylaxis; 4. The Boy Problem; 5. How my uncle the Doctor instructed me in matters of sex; 6. Health and Hygiene of Sex.

This same Society has issued to every freshman student attending the various colleges of this country a pamphlet which presents the subject in a way that should fairly appeal to him. All over the United States there is a great awakening. Eminent medical men, social workers, leaders in education, and many others are joining in the movement towards enlightenment of the masses in hygiene and especially sexual hygiene. The American Medical Association has published pamphlets in aid of this work. The Russell Sage Foundation, Department of Child Hygiene, is doing a great deal along the same line. The American League on Sexual Hygiene is sending out lecturers and literature. Addresses are being made to the masses everywhere. The audiences are large, attentive—even enthusiastic. The movement is too young yet to judge of results but if the same earnest effort is continued it must result in the saving of thousands of young from the evil effects of venereal diseases, and eventually give the Army and Navy a morally higher grade class of recruits.

NOTIFICATION OF VENEREAL DISEASES.

During the past few years the number of advocates for the notification of venereal diseases has been increasing, and so strong

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has this sentiment become that we are now able to record that the state of California has issued the following regulation:

Whereas it is the duty of the California State Board of Health to encourage and maintain a progressive campaign against all communicable and avoidable diseases which may endanger the health of the citizens of the state; and whereas the communicable diseases due to syphilis and gonococcus infections are among the most prevalent and most harmful to medical science and Whereas the policy of the State Board of Health, of physicians, and of educators has hitherto been one of silence on this subject, Therefore be it resolved, That the California State Board of Health declares that beginning with January 1, 1911, syphilis and gonococcus infections shall be reportable and shall be placed on the list of communicable diseases which local boards of health and health officers are required to report to the Secretary, it being provided, however, that until further action by this board, physicians may report the facts concerning these diseases by office numbers instead of names of patients; be it further resolved, That this board officially calls attention of the citizens of California to the contagious and infectious nature of these diseases and requests their co-operation in combating them by every available means—educational, sanitary, medical, social and moral.

This action of California indicates that she will first gain an idea of the real extent of these diseases and then put in force further measures looking to their diminution and possible extinction. The state of Vermont has recently passed a similar law and New York has favorably considered a bill of the same general character. In the state of Indiana the marriage of persons affected with tuberculosis, insanity, syphilis or gonorrhoea is forbidden. Of course this will not prevent the marriage of such diseased people, but registration will give the information necessary for their control.

Recently the Mayor and City Council of Chicago appointed a Vice Commission to investigate conditions in Chicago.[4] This Committee reported that vice conditions are similar in all American cities, but that the large city draws much of its patronage in vice from smaller cities, towns and the country, and so the disease of the city is spread throughout the land. In the Army and Navy we suffer especially from the disease of the large cities which act as storehouses for prostitutes and send their surplus stock where most needed. Among other things this commission recom-

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mended, 1. Registration of venereal diseases. 2. Segregation of infectious. 3. Treatment in hospitals of infected prostitutes. Other states are beginning to realize their responsibilities and while it is difficult to obtain official sanction, especially in civil communities, of measures looking toward the prevention of venereal diseases, the existence of which so many people try to ignore, there is a strong movement which will ultimately cause venereal infections to be placed on the list for registration with other well recognized and controlled preventable diseases.

PREVALENCE OF VENEREAL DISEASES.

It is at the present time impossible to get statistics covering the exact prevalence of venereal diseases in civil communities. The action taken by California and Vermont in requiring the registration of such diseases will, it is hoped, be followed by other states and eventually statistics will be forthcoming. Figures from hospitals and observations made by special workers in gynaecology and genito-urinary diseases have given us some valuable statistics. The Committee on Moral Prophylaxis in New York reported that from statistics collected in that city and Baltimore ten per cent of the men who marry infect their wives with venereal diseases. "Seventy per cent of all women who come to the New York hospitals for treatment of venereal diseases are reputable married women who have been infected by their husbands. In New York City there are reported annually twelve thousand five hundred cases of measles, eleven thousand cases of diphtheria, and about nineteen thousand of tuberculosis; in round numbers forty-one thousand cases of infectious diseases. During that same period are treated two hundred and forty-three thousand cases of venereal diseases, namely, six times as many as from these three communicable diseases." (Swarts, report of State Sanitary Officers, 1910). Tables A and B show the prevalence of these diseases in the Army and Navy during the past few years. It will be noted that during the year 1908 in the Navy, the total admissions for gonorrhoea, chancroid and syphilis were 468, a yearly rate of 91.81 per thousand, while in the next year, 1909,[5] the plan of admitting to the sick list all cases of venereal

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disease as soon as discovered, was put in force. The result was that the admission rate for these diseases nearly doubled, being 160.40 per thousand. These figures prove that venereal disease has existed to about the same extent in the Army and Navy, but that different methods of keeping records have heretofore been responsible for the different totals. It has been suggested by some critics, that because venereal prophylaxis was put in operation on the Asiatic Station during the year 1908, in 1909 there should have been a reduction, while actually the recorded disease was double in 1909. The reason has been explained. Besides, the number using the prophylactic treatment was too small to affect the total.

In the presence of an increasing admission rate for the whole Navy, due to new methods of keeping statistical records, it is evident that the Asiatic Station having been the first to adopt the prophylactic treatment should also be the first to show a decrease in the admission of venereal disease. The figures from seventeen ships and stations on the Asiatic Station show total admissions of 270 for the third and 238 for the fourth quarter 1909, and 204 for the first quarter 1910, a reduction of twenty per cent.

In the report of the Surgeon General, U. S. Navy, for the year 1910, he states "It may be predicted without extravagance that because other ships and shore stations have assumed these activities (i. e., prophylactic treatment), approximately a year later than the Asiatic Station, the admission rate for the entire service will be very high for 1910, but that two years hence the rate shown for 1911 should unquestionably prove that the battle against the venereal peril is a decisive one."

In the Navy for the year 1909 venereal diseases (syphilis, gonorrhoea, chancroid) caused 139,396 sick days, which is equivalent to the loss of 4,646 men for one month. Or stated in another way, venereal diseases caused the loss of sufficient men to man five battleships for a period of one month.

The term "sick day" means the disability of one man for one day. This term has been in use for many years by the Navy and at the recent meeting of the International Commission for the Unification of Medical Statistics of Armies, was adopted for

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general use. In my opinion it is the most valuable of all statistics as it shows at a glance the disability from a disease, in terms that any layman can understand.

At the Naval Training Station at Norfolk, which is the largest of the three recruit stations of the Navy, during the year 1909 there was an admission rate of 331 per thousand, while during the first quarter 1910, although a material reduction had been made, it was still 217 per thousand. Think of it, twenty per cent of the recruits received at this station become infected before they have rendered any service to the Government.

The admission rate for venereal diseases in our Army for the year 1909 was (Report of the Surgeon General for the year 1910) 196 per thousand, which is much greater than that of foreign Armies. This difference may be partly explained by different methods of keeping statistics but it is my opinion that the real cause of this great difference is because venereal prophylaxis is compulsory in the countries which make the best showing in this respect, Germany, France and Japan. The latest available figures are:[3]

British 75.8 per thousand.
Austrian 54.2 per thousand.
Japanese 37.60 per thousand.
French 34.8 per thousand.
Prussian 18.72 per thousand.

In the Army during the year 1909 there were 222,924 sick days from gonorrhoea, 49,156 from chancroid and 82,424 from syphilis, a total of 354,504 sick days from these diseases. This is equivalent to a total disablement of our Army of seventy-five thousand men for a period of nearly five days or the disability of a force of ten thousand men for a period of one month. And the records for the year nineteen hundred and ten will no doubt show an increase despite the partial use of some form of prophylactic treatment.

CAUSES OF VENEREAL DISEASES.

Of course the causes of venereal diseases so far as the Army and Navy are concerned are the presence of infected prostitutes

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and of men who desire to have sexual intercourse with them. Elimination of either would cause the diseases to cease. Measures which have been proposed against the diseased prostitutes include registration, treatment in hospitals and periodical inspection.

Registration is already an assured fact in the states of California and Vermont and compulsory treatment is also probable. Further education of the public will be necessary before inspection of prostitutes becomes possible.

There are, however, in the Army and Navy, certain contributory causes of venereal diseases, the remedy for which lies partly in our own hands. Some of these causes are:

Lack of adequate amusement for enlisted men.

Intemperance.

Discrimination against the uniform.

Ignorance.

Lack of restriction of the diseased.

AMUSEMENTS.

It is evident that venereal disease is contracted while on liberty away from barracks, camps, Navy Yards, ships and recruit rendezvous. Troops on march and bluejackets away from cities have very little venereal disease. Let us then make the station or post as attractive as possible so that the men are not forced to go to town for simple amusement, as they most certainly now are, in the Navy. This condition aboard ship is unavoidable but very little has been done at Navy Yards to provide a place where enlisted men may assemble for the afternoon and evening. First of all athletics by using up surplus energy, giving vent to pent-up enthusiasm and providing a healthy rivalry, should receive every encouragement. As a rule too few men engage in athletics. Company teams should be encouraged. It is my impression that the enlisted men of the Navy enter more generally into athletics than in the Army. Perhaps this is because on each ship there is an officer especially appointed to look after athletics, and the practice of athletic teams is considered a drill; absence from it or shirking is an offense and is punished. At Guantanamo, I

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have seen as many as seven baseball games going on, all the participants being made up of men from the same ship, and there were probably not more than two hundred men from that ship on shore. Swimming is now compulsory in the Navy and can be indulged in at most posts. It should be encouraged in every way. The best method to encourage learning, is to divide the men into squads of five or ten, under a good swimmer, and offer a small prize to the instructor who qualifies the most men. In the winter it is a great problem to provide proper outdoor exercise and amusement. Indoors some Army posts have gymnasia, recreation rooms and Y. M. C. A. buildings.

The Navy has nothing of this sort, though the generosity of private individuals has provided in a few cities Naval Y. M. C. A. buildings which are very popular and the accommodations of which are overtaxed. In every Navy Yard or Station there is great need for an enlisted men's club, which should contain reading, recreation, dining and sleeping rooms.

INTEMPERANCE.

It is my firm belief that the great majority of enlisted men are somewhat under the influence of some intoxicant before having illicit sexual intercourse. The action of alcohol in stimulating the sexual desire and benumbing the moral nature is well known. One drink frequently is all that is necessary to destroy the normal balance. It is thought that the provision of club rooms, in the station or post, furnished with pool and billiard tables, bowling alleys and other conveniences so that a man is not forced to seek amusement elsewhere will do much to reduce intemperance.

An energetic chaplain finds his opportunity for this and is of enormous help to the medical officer, for it is he whom we must rely on for the moral teaching.

THE CANTEEN.

The canteen at Army posts was abolished in 1901, it being argued that its suspension would conduce to sobriety and good conduct. The result has not been what was expected or desired

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by its abolishers. The testimony of commanding and medical officers of the Army is that the men have been driven from the post canteen where they could obtain pure beer under supervision, to "vile brothels around the borders of the reservations, where they drink all manner of alcoholic beverages and often sink into debauchery and ruin." In his report for the year 1907 the Surgeon General of the Army says:

"This office concurs in the opinion expressed by most medical officers of the Army, that the abolition of the sale of beer in post exchanges has much to do with the increase of venereal diseases and alcoholism in the Army, by driving the soldiers to disreputable resorts outside of the post and beyond control of the post authorities."

"The canteen is the soldier's club, where he can obtain beer and soft drinks, meet his comrades socially, play games and read magazines under decent conditions. Its alternative is the saloon where he drinks bad whiskey and meets questionable associates of both sexes."

Previous to the abolition of the canteen the mean annual rate of admission for venereal diseases in the army was 7.5%; in 1909 it had risen to 20%.

DISCRIMINATION AGAINST THE UNIFORM.

Discrimination against the uniform has done its share to drive men into the lowest type of saloons and houses of ill fame. Twenty-two states and the Congress of the United States acting for the territories and the District of Columbia have enacted laws punishing discrimination against the uniform, but much more needs to be done. We find in some localities that even though there is a state law prohibiting this discrimination, the local authorities are loth to enforce it. These local authorities should be in sympathy with the aims and plans of the commanding and medical officers of the post or station, and it is believed that frequent conferences in a friendly spirit would do much to bridge the rough places and bring about mutual understanding. Certainly the good will of the community adjacent to a post or station is worth having. Strange to say this discrimination is

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frequently practiced by managers of cheap dance halls, whose clientele is as a rule of a distinctly lower grade socially than the enlisted man who would attend. In recent cases, enlisted men in civilian clothes were welcomed while the same men in uniform were refused admission.

This is a survival of the prejudice, against the enlisted man, which grew up in the old days when liberty meant a wild carousal and people feared a bluejacket almost as much as a rattlesnake. This prejudice will fall if a campaign of education is pushed against it and people are shown just what the average enlisted man is.

As it is now in the Navy, men are sent ashore in a strange town or city, refused admission at various places of amusement because of their uniform and then drift around until they find a hearty welcome at disreputable saloons where they are urged to drink poor liquor, and form the acquaintance of dissolute women.

Nothing in my opinion does more to lower an enlisted man's self-respect and diminish his regard for the service than the humiliation put upon him by the owners of some places of amusement.

RESTRICTION.

While at the present time it would be hard to find any locality where venereal diseases do not flourish, in times past the soldier and sailor have shouldered the blame for the implantation of venereal diseases in many places. Certainly we owe it to every community to restrict all of our men who are infected and keep them so restricted until they are perfectly well. And yet there are medical officers who have gone on record officially as being opposed to this restriction.[6]

The prompt discovery of disease either at sick call or at the regular weekly inspection should be followed by the restriction of the patient to the limits of the post or station. He should be placed in a separate mess and required to wash and use his own mess gear. He should also be instructed to use the water closets set apart for venereal patients. A list of these latter is posted on the door of the general water closets and a request made that any venereal seen using these closets be placed on the report.

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IGNORANCE.

After enlistment the recruit should receive a systematic instruction in hygiene. This instruction should cover the following subjects: The daily bath and the evacuation of the bowels; care of the teeth and mouth; care of the feet; attention to the hair and nails; food, the necessity for regularity in meals and the avoidance of excesses in food and drink. Alcohol and the dangers incident to its use; tobacco and its injurious effects on the immature. The physiology of the sexual organs; venereal diseases, their injurious effect on the individual and their transference to wives and children. Prophylactic treatment and its value. These subjects should be presented in an interesting way. An enlisted man is not a statistical expert. Tables of figures and the barest facts do not appeal to him. Put a little humanity into the talks. It should be remembered that our recruits are young men of limited education, usually ignorant of all phases of hygiene, but most of them willing and anxious to learn.

THE PROPHYLACTIC TREATMENT.

Does the prophylactic treatment protect against venereal infection? This question has been so thoroughly discussed and proven that it seems hardly necessary to give any evidence here. The medical officers of the "Tacoma,"[8] "Rhode Island,"[7] "Ranger,"[14] and "Wisconsin" report about 4,750 exposures followed by the treatment, giving nine cases of infection, while the medical officer of the "Dolphin"[9] reports 13,860 men going on liberty, number of exposures not given, and no case of venereal diseases resulting among those who took the treatment. In the last 500 exposures of men in the command in which I serve, about five per cent took the treatment in from twelve to thirty hours after exposure, only one case of infection resulting. Previous to the beginning of this treatment this same command had admitted to the sick list thirty-five cases of venereal diseases in the months of April, May and June, 1910. During the month of June compulsory prophylaxis was put in force with the result that during the succeeding months —July, August and September, 1910—there were two admissions only—and these two had not taken the treatment.

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Probably each medical officer in the service has worked out a scheme for the application of the preventive treatment of venereal disease. The one which I think answers the requirements best has been in force on this ship for about a year. During this time various modifications have been made as new conditions had to be met. When it was finally decided to make the treatment compulsory, a series of lectures were given by the medical officer explaining in detail just what it was thought would be the result of the treatment. These were continued throughout the year. A careful record has been kept of the last five hundred men who admitted exposure (sexual intercourse with prostitutes) and who returned and took the prophylactic treatment. In every case but one this treatment gave perfect protection—in one case gonorrhoea followed, presumably because the treatment was not properly given. When a recruit is received he is given the following card to read, so that even if he does not receive any other instruction he knows at once that compulsory prophylaxis is in force.

WARNING CIRCULAR.[10]

1. To have sexual relations with any woman who practices prostitution exposes you to very paintul and life-endangering diseases of long standing, which may be transmitted to your future wife and children, rendering them mentally and physically defective.

2. A prostitute presenting a physician's certificate of health proves thereby only that she was in health when examined. She may have contracted a dangerous disease a few minutes after the examination.

3. The mouth secretion in such women is often capable of transferring disease, hence kissing, or the use of a cup or glass, spoon, fork, etc., which may not have been thoroughly cleansed after being used by a prostitute, may transmit syphilis with its horrible consequences.

4. The fact that a prostitute appears clean and free from the signs of the disease does not prove her so. The absence of disease can be established only by a very complex medical examination.

5. If, with a knowledge of what little has been told you herein, you will risk your health and life, you must endeavor to protect yourself and those about you by a simple treatment to be obtained upon application at the sick bay and used as soon as possible

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after returning from liberty. No man who has been exposed to venereal infection ashore should neglect to seek the treatment to be obtained at the sick bay promptly upon return from liberty. Remember that to conceal a venereal disease you lay yourself open to severe punishment.

Special rooms where the treatment can be given are desirable but not absolutely necessary. The facilities afforded by the bath room and isolation ward on this ship have been sufficient for the crew—the number varying from 200 to 700 men. All that is really necessary are a dozen basins for washing the genitals in warm water and soap, a dozen more for bathing in bichloride solution, small squares of gauze for both washing and drying the parts, jars of calomel ointment, green soap and protargol solution. A large supply of syringes is at hand and as each one is used it is thrown into a jar of 5-100 phenol solution and sterilized before being used again. Men going on liberty who desire it are given a syringe, small bottle of protargol, ointment and cotton. It is so simple that after one treatment given by a nurse, the recruit is perfectly competent to give the others himself.

The treatment in detail is as follows:

1. Wash parts in hot water and soap after urinating.
2. Wash penis and scrotum in a 1-2000 solution of bichloride of mercury.
3. Inject 2 c.c. of solution of protargol 2% and 20% glycerine and hold it in urethra for five minutes.
4. Wipe penis and scrotum dry.
5. Apply calomel ointment 33% over whole penis and leave on for two hours.

Men as soon as they return from liberty report at the sick quarters for the treatment. Each man is given a basin containing hot water, a little tincture of green soap is poured on the penis and scrotum and they are scrubbed with a square of gauze. The parts are then rinsed in water and wiped with gauze wet with 1-2000 bichloride solution. 2 c.c. of 2% protargol solution are then injected into the urethra with an ordinary hard rubber or glass syringe and retained for five minutes. Wipe the parts dry and apply the calomel ointment over the whole penis and leave on for not less than two hours. The majority of the men leave

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it on for a much longer time as it causes no discomfort. It is probable that the washing with bichloride solution might be dispensed with, but as it takes practically no additional time it has been retained.

Do men object to the treatment? NO. I can personally speak only of observations made in the Navy, but human nature is about the same everywhere. Personally I have never heard of an enlisted man REFUSING to take the treatment, though many neglect to do so, nor have I ever known of one complaining to either the commanding officer of this ship or to his immediate company or division officer about the treatment.

The keynote of success is to make the men feel that what you are doing is for their good, that you are thoroughly in earnest, that if they do their part they escape a loathsome disease—that if they don't, they not only acquire that disease but also a severe punishment. A copy of the liberty list of each day is kept, and also a record of the men who take the prophylactic treatment. A man who develops disease and who has not taken the treatment is considered as having disobeyed orders and is punished accordingly by the commanding officer. Once in each week the whole personnel is inspected by the chief surgeon, particular attention being paid to the genitals. In this way cases of concealed disease are discovered and the punishment for these cases is greater than for those who fail to take the prophylactic treatment but report disease as soon as it is noted. Success depends on attention to detail. Regulations when placed in force must be carried out. Half-hearted measures will not suffice. Personal attention by the surgeon is absolutely necessary as is the hearty co-operation of the line officers. This latter is very important. Every detail and its importance must be fully explained to them before the measures are put in force. When fully understood I have never yet met with a line officer who when asked to do so did not cooperate heartily in making the measures effective and in punishing delinquents when such were discovered.

The following order was issued by the senior officer of the command in which I am serving after a talk of only a few minutes in which I told him what the prophylactic treatment had done and would do.

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U. S. S. ----------,

----------,

Feb. 10, 1911.

Members of the crew who are afflicted with any form of venereal diseases whatsoever will be permitted to use only the starboard head.(a) A list of such men will be furnished each week by the Medical Officer. Men whose names are on this list will positively be forbidden to use the port head at any time. This order is given for the purpose of protecting clean and healthy members of the crew from infection and diseases; therefore every man in the crew should assist in carrying out this order by reporting the name of any infected member of the crew who makes use of the port head.

There is no reason for any man contracting venereal diseases of any sort, except laziness, uncleanliness, and an utter carelessness as to his own health and that of his shipmates. Any man who will carry out the orders of the ship with regard to visiting the "sick bay" after returning from liberty for the proper and simple treatment necessary, or who will learn to give himself this treatment, can feel absolutely sure that he will contract no venereal diseases or gather vermin of any sort; therefore no excuse will be considered.

By order of

R. K. ----------

Lieut. Commander, U. S. N., Commanding.

Recently some work has been done to show that calomel[12] ointment is an efficient preventive of gonococcus infection. I have one report from an officer who states that he has given each man going on liberty a small box of calomel ointment with instructions to apply to the parts and squeeze a little into the urethra after having had sexual intercourse. These men, however, received the regular prophylactic treatment upon returning to the ship from liberty. During six months this command of 160 men developed only two cases of venereal diseases.

Colonel L. M. Maus[11] has devised a special collapsible tube containing calomel 25%, benzoinated lard and suet which he states has been found to prevent all forms of venereal diseases when used "within a reasonable time." If further use justifies the claims of Colonel Maus these tubes would be an ideal method of dispensing the prophylactic.

The one objection, and it is a very great one, to relying on the application of the prophylactic by the enlisted man himself im-

(a) Watercloset.

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mediately after sexual intercourse, is that as so many are more or less under the influence of liquor they either lose, forget or do not properly apply the prophylactic. For the present the compulsory treatment at the ship or station is considered necessary.

INSPECTION OF CREW.

In making inspections particular attention must be paid to securing proper light. As a rule there is no difficulty in getting light on the recruit while in barracks on shore, but on board ship in nearly all cases artificial light is necessary. It saves time to have the men march to the sick bay in companies. The surgeon sits in a chair with a cluster of electric lights in a reflector just over his head. The men are formed in a single line, each advancing to within one pace of the surgeon where the trousers and drawers are dropped to the knees and the shirt pulled up to the waist. The surgeon is in comparative darkness while the man gets the full glare of the light. By this means small abrasions, tiny ulcers and other conditions that could not be discovered in an ordinary light, are readily detected.

A careful inspection of the whole crew is in my opinion absolutely necessary. To be effective men must be inspected by a medical officer. Those who are found to have venereal diseases or those with ulcers or abrasions on the penis are placed on the restricted liberty list and are not allowed to leave the ship or station until well. I found in this command that after the first two inspections were made, no more venereals were found. Men preferred to report as soon as they noted the disease rather than face the punishment given if the condition was discovered at inspection.

TREATMENT.

When the question of the actual treatment of these men of the enlisted force who are suffering from venereal diseases is considered, we are forced to admit that there is room for improvement. Colonel Maus[13] in a recent article calls attention to varied methods of treatment by medical officers in the service and the fact that few reported the use of the microscope and the Wassermann reaction in making an early diagnosis in syphilis.

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The appearance of secondary symptoms was usually awaited before beginning treatment. The treponema is easily found in serum from the initial lesion by using the dark ground illuminator or by staining by the Giemsa or India ink method.

The Wassermann reaction gives us positive information in most cases and should be used where there is any doubt as to the diagnosis. In salvarson we have a drug which has a wonderfully rapid effect in causing the disappearance of lesions of mucous membranes. With this drug the acute infectious stage of syphilis can be materially reduced and the patient not restricted for so long a time as formerly. If mercury is given the deep intramuscular injections are in my opinion the best method for a military service to use. There are no pills to be thrown away or forgotten. The patients are assembled at stated times, carefully examined and the proper dosage given; this dose to be varied or omitted as necessary. Early diagnosis and prompt treatment while not reducing the number of those infected will very materially lower the number of sick days and shorten the infectious period in each case. Infected patients are given the following circular and asked to read it frequently.

INSTRUCTIONS FOR THOSE HAVING SYPHILIS[10]

(LUES, POX, BLOOD DISEASE.)

Syphilis is a treacherous and dangerous disease of the entire system. It is curable, but is only cured by a long course of treatment lasting for several years, even when there are no external signs of the disease. A perfect cure requires at least two, preferably three, years of faithful treatment, because it is "in the blood." Healing the chancre and taking the medicine for a few weeks or months, until the visible signs of the disease disappear, will not cure your blood of the syphilitic poison. It is therefore necessary that you follow the doctor's orders most carefully. If you do not, you are in danger of having the disease appear in the future in some important part of the body, like the brain, spinal cord, bones, arteries, or other organs as the liver. If you do not follow directions it is also probable that your wife and children will acquire the disease from you. Syphilis is extremely contagious, especially by the sores and erosions, however small they may be, which generally occur on the genital organs and in the mouth, but which may be produced in any part of the body. A patient with syphilis must, therefore, abstain from any sexual intercourse, during the first year especially, when even he has

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the smallest evidence of a sore or break in the skin on the genital organs. He must also abstain from kissing when he has sores on the lips or tongue or in the mouth, for a kiss even on healthy skin, may be dangerous. The disease may also be transmitted through the medium of any object which has been in contact with the secretions of the disease—glasses, toothpicks, spoons, forks, bottles, pipes, plug tobacco, cigars, cigarettes, linen, towels, brush, comb, soap, razor, clothing, mess gear, etc.; in fact any contact with a syphilitic person or the secretion of the disease is dangerous. It is very important for a syphilitic subject affected with any other illness to always inform the doctor of his former syphilis, for this knowledge may be useful for the direction of treatment and the cure of the complaint, even when the syphilis is long cured. It will therefore be entirely to your own benefit for the doctor to know about your syphilis.

The following directions are of particular importance during the first year and whenever, if you neglect yourself, the symptoms break out again:

1. Alcoholic liquors in all forms must be avoided, because alcohol is a poison, which, added to the poison of the syphilis, makes the syphilis much less likely of perfect cure.

2. Do not smoke or chew tobacco, because the irritation of the tobacco increases the severity and duration of the mouth sores of syphilis, and sour, acid, peppery, and spicy foods and pickles should be avoided for the same reason.

3. Brush your teeth and wash your mouth every night and morning. Cleanliness of the teeth and mouth decrease the severity and duration of the mouth sores of syphilis.

4. Have the dental surgeon treat your teeth if they are bad. Tell him that you have syphilis, so that he may take precautions against catching the disease himself or giving it to other patients.

5. To avoid giving the disease to your family, friends, or shipmates, observe the following rules strictly:

(a) Always sleep alone.

(b) Always use your own toilet articles, such as towels, brushes, combs, shaving brushes, razors, soap, etc.

(c) Have your own razor and shave yourself.

(d) Have your own mess gear and keep it apart from others.

(e) Always avoid kissing anyone, especially young children and especially during the active period of the disease (the first two years). The innocent party can hardly escape infection with syphilis if you have open sores in the mouth.

(f) Always keep only for your own use any articles which have been in contact with your mouth, such as toothbrushes toothpicks, pencils, pipes, cigars, cigarettes, forks, spoons, cups etc.

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(g) Always burn or throw overboard all dressings which have been in contact with sores or wounds.

(h) If you disobey these instructions, you will certainly give the disease to innocent persons.

Remember that the Navy Regulations require that you should not conceal this trouble, but seek treatment promptly from the doctor. Concealment or self treatment of this disease makes you liable to severe punishment.

Are not many men with chronic gonorrhoea turned loose to do their share in infecting others? The large number of civilians who treat themselves would naturally furnish a larger percentage of the uncured, as the patient judges his cure or the reverse by the amount of personal discomfort and the profuseness of his discharge. It is urged that our patients should be kept under observation and restriction until the microscope shows no more gonococci and the urine is free from shreds. Patients when admitted with gonorrhoea should be given this, or a similar circular, and requested to read it frequently.

INSTRUCTIONS FOR THOSE HAVING GONORRHOEA (CLAP).[20]

Your disease is not a simple but a serious matter, and requires great care in treatment by the doctor and strict obedience to the directions by you in order to restore the organs to perfect health. It is, therefore, necessary that you do with faithfulness what the doctor orders. If you do not, it is possible that the disease will produce later in your life serious conditions which may damage your health and indeed threaten your life. Gonorrhoea is a communicable contagious disease, and in order to avoid infecting other persons and to prevent such complications as bubo, swollen testicles, abscess, stricture, etc., the following rules should be observed:

Do not drink any intoxicating liquors whatever, because the alcohol in the urine damages the diseased parts, and do not drink any spicy or soft drinks, like ginger ale, whatever, for the reason that the spicy material in the urine irritates the diseased parts, and do not eat any peppery or spicy foods or pickles whatever or drink coffee or tea for the same reasons.

Do not take any violent exercise, as far as possible, such as running, horseback riding or bicycling.

Do not indulge in any sexual excitement or sexual intercourse whatever, directly or indirectly, until pronounced cured by the doctor, as the disease may be given to a woman even after the visible discharge has ceased. Moreover, sexual excitement al-

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ways prolongs and aggravates the disease, through the erection of the penis.

You must wash and dress the penis with the gauze apron at least three times daily, or as directed by the doctor and under the supervision of a sick bay attendant.

Do not use cotton over the mouth of the penis, because it corks in the discharge, and do not wear the so-called "gonorrhoeal bag," because it soon becomes smeared with pus inside and is then dangerous.

You must always burn or throw overboard all soiled dressings.

You must always wash the hands after dressing the penis because the discharge is blinding, and may be carried to your eyes by dirty fingers.

You must sleep alone and be sure that no one else uses any of your toilet articles, particularly towels and wash cloths.

Your bowels must move once every day.

You must drink all the water possible, excepting during meals and up to six hours before going to bed.

You must remain reasonably quiet, and must take the medicine regularly and as directed.

You must treat chordee by wrapping cold, wet cloths about the penis, and after the erection has subsided by emptying the bladder. Never force the penis down, as you may rupture it.

You must come for treatment with as much urine in the bladder as possible, so that the doctor may examine the urine at each visit.

"Shreds" or "floaters" in the urine show that you are not yet well and are still in a condition of danger to yourself and to any woman with whom you have intercourse.

Remember that to conceal this trouble lays you open to severe punishment.

PUNISHMENT.

Do the present regulations of the Army and Navy give Commanding Officers sufficient authority to punish men who fail to take this treatment and then develop disease? Yes. A man who is ordered to take the treatment and fails to do so is guilty of disobedience of orders, punishment for which is clearly laid down in the regulations. If the time and care is taken to thoroughly educate line officers to a proper understanding of this subject, there would be no trouble in securing their absolutely necessary co-operation. The Medical Officers of the Atlantic Fleet are now enabled to "attack the problem vigorously through the authority and support implied in a circular letter of the Commander in Chief to the Commanding Officers of ships dated May 22, 1910."

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That venereal prophylaxis was not likely to succeed on any ship or fleet, in the absence of disciplinary measures for those who fail to comply, was observed by Medical Inspector Diehl of the Asiatic Fleet, who stated "The co-operation and support of the commanding officer are absolutely essential. Severe disciplinary action will soon reduce the percentage of those who fail to report, deny exposure or conceal disease."

CO-OPERATION.

Along what lines should we seek the co-operation of the federal, state, and municipal authorities? From the federal authorities permission should be secured for the resumption of the canteen and for enlisted men's clubs at Naval Stations and Yards. The arguments set forth in favor of these have been stated elsewhere. It is believed that sufficient authority already exists in both the Army and Navy to enforce all measures concerned in venereal prophylaxis so that no further powers need be secured from the federal authorities. Co-operation with the state boards of health should, as previously stated, prove most valuable. California and Vermont have already required registration of venereal diseases and this action should be used to assist other state boards in securing the same law and providing for the hospital treatment of those infected.

The medical officers of the Army and Navy form a well educated homogenous body, well adapted to spread information of this sort and with a peculiar interest in the passage of such laws.

The medical reserve corps of the Army, the medical officers of the National Guard and those of the Naval Militia, composed of the best type of medical men, can be of inestimable value in pushing the movement for the instruction of the public in sexual hygiene and in co-operating with state and municipal boards of health to secure registration and the various other measures advocated for the suppression of disease. But these officers are busy practitioners in private life and to enlist their sympathy and support we must acquaint them thoroughly with our aims and object. The annual meeting of the Association of Military Surgeons affords us an opportunity to present this subject personally to a large number and another yearly opportunity is at the meeting of the American Medical Association.

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The municipal authorities are those with whom we are most closely brought in touch. With them perhaps should our best missionary work be done. The great interest which has already been taken by municipal bodies in compelling compulsory vaccination, the registration and isolation of most infectious diseases and recently the instruction in hygiene and medical inspection of school children, shows to what extent the state officials can be induced to go when convinced that the condition warrants such action.

In securing the co-operation thus suggested, a board consisting of the Surgeons General of the Army, Navy and Marine Hospital Service, with such additional officers as they deem necessary, should be formed to consider the question of working with state and other officials to secure the best results and also to formulate a scheme involving the proper treatment and disposal of venereals. The weight of the opinion of such a board with official sanction of such recommendations as are made by it should be sufficient to force those medical officers who still oppose venereal prophylaxis and restriction of those who are diseased, to use these measures.

TABLE A.

Navy.

Table of admissions and rates for venereal infection since 1880.

Year	Syphilis	Gonorrhoea	Chancroid	Total Admissions	Total admission rate per thousand.
1880	451	212	72	735	81.64
1881	403	213	108	724	75.85
1882	490	216	113	819	87.40
1883	340	252	93	685	74.48
1884	330	298	171	799	80.23
1885	279	370	181	830	90.31
1886	278	389	201	869	94.58
1887	244	396	167	807	88.90
1888	296	348	228	872	87.59
1889	310	316	118	744	66.32
1890	256	286	152	694	58.97
1891	198	284	100	582	50.60
1892	174	329	111	614	52.14
1893	171	304	60	535	44.18
1894	272	501	208	981	78.36
1895	239	330	152	721	58.48
1896	239	303	131	673	47.43
1897	270	323	136	729	47.87
1898	283	503	190	1,076	46.71
1899	406	517	226	1,149	57.13
1900	465	525	214	1,204	52.40
1901	546	617	217	1,380	52.87
1902	606	771	284	1,661	54.91
1903	816	1,032	396	2,244	61.42
1904	880	1,512	542	2,934	74.04
1905	981	2,085	538	3,604	91.83
1906	1,147	2,640	733	4,520	108.42
1907	881	2,274	554	3,709	84.14
1908	1,001	3,015	665	4,681	91.81
1909	1,476	5,861	1,573	8,910	160.40

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TABLE B.

Army.

Admission rate of venereal diseases in the United States.

Admission rate per thousand.

Year	Syphilis	Gonorrhoea	Chancroid
1905	30.02	118.31	30.39
1906	27.28	105.21	26.41
1907	25.36	107.68	34.78
1908	28.15	128.50	28.20
1909	26.85	125.27	25.33

TABLE C.

Army.

Total admissions for venereal diseases, 1909.

	Syphilis	Chancroids	Gonorrhoea	Total
United States	1,534	1,447	7,156	10,157
Alaska	7	7	43	57
Cuba	14	27	25	128
Hawaii	60	26	143	229
Philippines	592	733	2,552	3,877
Transports	56	47	114	217
Total	2,263	2,287	10,000	14,640
Ratios per 1,000 of mean strength	30.45	30.77	135.77	196.99

Days	354,508
Constantly sick	971.25
Ratio per thousand	13.05

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DEMENTIA PRAECOX AND CHRONIC ALCOHOLISM.*

By Capt. L. L. SMITH, Medical Corps, U. S. Army.

THE subject of alcoholism as here considered is to be discussed only in so far as it complicates or is symptomatic of psychoses due to other causes and where a differential diagnosis is necessary.

The occurrence of different psychotic states simultaneously, superimposed one upon the other, is occasionally found in the study of mental cases, and as a result of this the diagnosis is rendered proportionally more difficult. As is quite well known, alcohol often complicates many of the psychoses; especially to be mentioned is paresis, in which the alcoholic excesses in the early stages are frequently erroneously regarded as the cause rather than a symptom of the disease.

We also occasionally find alcohol complicating cases of dementia praecox and manic depressive insanity, producing rather atypical pictures of these diseases. These latter cases must be examined from the mental side just as carefully as those of infectious nature complicated with alcohol are to be examined from the physical side. In the psychiatric ward of a large general hospital it is by no means uncommon to find cases of infectious origin complicated with alcohol, which on admission were considered to be purely alcoholic psychoses; but in which a careful physical examination, with the aid of the laboratory findings, revealed the true nature of the trouble.

If careful search were made of the records of the alcoholic wards of the larger hospitals, it would probably be found that among others a certain class of patients is admitted suffering from what appears to be an alcoholic excitement but which later proves to be incurable and exhibits symptoms suggestive of dementia praecox. This at least has been the experience in a number of the hospitals for inebriates abroad.

Stöcher's (1) valuable contribution to the study of alcoholic psychoses, which was recently reviewed by Karpas, gives the

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results of a careful study of the alcoholic cases of the Erlangen Hospital for the Insane. Stöcher's thesis may be stated as follows:

"Alcoholism is the result of a diseased constitution but not the cause of a characteristic chronic psychosis. Alcoholism is quite often an expression of psychopathic constitution, which may be either acquired or congenital and indeed Bonhöffer has already emphasized this important point."

Among the cases studied he mentions "a group of fourteen cases of dementia praecox, in which chronic alcoholism aided the precipitation of the fundamental disease process. Ten cases, in which the diagnosis of chronic hallucinosis with deterioration (Kraepelin) was made, showed that the patients before the development of the alcoholic habit exhibited striking symptoms of a psychopathic constitution—peculiar to dementia praecox. In early childhood they were already noted as seclusive, peculiarly quiet, unsociable, rather misanthropic, irascible, easily irritated and evinced other eccentricities. These patients, upon their admission, were usually in a delirious state, and with the subsidence of the acute manifestations dementia praecox traits crystallized out. While alcoholism was doubtless the precipitating cause of the acute outbreak, yet one cannot lose sight of the original psychopathic constitution. Beyond the shadow of a doubt alcoholism was at the same time a symptomatic reaction of the actual disease process. Stöcher believes that Kraepelin's differentiation between dementia praecox and alcoholic hallucinosis with mental enfeeblement is rather superficial. He feels that all these latter cases belong to the dementia praecox group. He asks why the individual with a dementia praecox constitution becomes addicted to the alcoholic habit but he does not wish to commit himself to any particular theory. He believes that some begin to drink while in a state of mild excitement, others cultivate this habit in relation to opportunities and with others it is purely an endogenic expression."

Stöcher's conclusions are as follows: "Chronic alcoholism in the first place is a symptom of a mental disease. It may, however, so exaggerate stationary epilepsy, chronic mania, dementia praecox, etc., which hitherto were latent and perhaps would re-

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main still latent without alcoholic abuses that it may lead to a sudden outbreak—a turbulent disease manifestation. It may also give these diseases peculiar traits or a peculiar coloring for some time, which above all may appear as the most striking phenomena, and thus cover up the symptoms of the fundamental disorder. Furthermore, it may also, on the basis of this constitutional disease, give rise to independent clinical pictures."

Graeter (2) in a recent monograph on dementia praecox and chronic alcoholism presents a number of case histories and has grouped them as hebephrenic, catatonic and paranoid forms. His investigations were made especially on those cases which had presented diagnostic difficulties in the beginning and which later were diagnosed as undoubted cases of dementia praecox. The most of these cases had been under the observation of asylum physicians for a considerable period, in most cases from five to ten years, in one case fifteen, and in another twenty years. Discharged patients were further observed whenever possible in their home towns. He further supplemented the history with information obtained from their relatives and associates.

Among the reasons for the diagnostic errors in these mixed cases, Graeter mentions the insufficient history of the cases, that in the beginning the signs of dementia praecox were masked by those of alcoholism occurring simultaneously and are thus pushed into the background; he finally mentions the fallacious conclusions of the practicing physicians.

For a full understanding of these cases he asks the following questions: (1) Wherein do the pictures of chronic alcoholism and dementia praecox resemble one another? (2) Wherein do they differ? (3) In what manner is the picture of dementia praecox altered by the addition of alcoholism? (4) How is alcoholism influenced by dementia praecox? (5) How can one recognize the presence of dementia praecox in an alcoholic? He then takes up first the similarity between dementia praecox and alcoholic dementia and concludes as follows: Chronic alcoholism is similar to dementia praecox in that it is a disease which leads gradually, sooner or later, to a well-developed dementia. The course of these two diseases is often interrupted through exacerbations and excited states of many kinds. If we see these states

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of acute excitement previously in dementia praecox or chronic alcoholism and follow them throughout their course, we notice that they are somewhat similar in their main features. In considering chronic alcoholism he included only those mental disturbances which continued for a considerable time after the withdrawal of the alcohol, at least for one year and in some cases several years. The similarity of the two deteriorating processes consists next in an increasing indifference concerning the surroundings; the diminished acceptance and assimilation of new impressions. The thing that is expressly noticed is that the patient neglects his work or duty without apparent cause; but not less striking in both is the stereotyped manner of thinking, the desire to use common, high-sounding phrases, vulgar jokes, etc. The deterioration which in the two diseases can lead to absolute mental and physical inactivity is accompanied with irritability, psychomotor unrest and change of character. Ethical feelings and sense of shame are dulled, the views of others are disregarded, and affection for relatives is diminished. Both diseases show also a high degree of disturbance in the volitional field. This deteriorating process is frequently interrupted in dementia praecox by states of hallucinatory excitement with delusions, which may gradually take on a chronic form. This chronic hallucinosis seldom occurs as a terminal stage of alcoholic deterioration.

Second, the differentiation between alcoholic dementia and dementia praecox is then stated by him as follows: Because of the alcoholic's neglect of his duty, of his mental incapacity occasioned by his alcoholic habits, he is left idle, contracts debts, etc, but his mind, however, remains relatively active. On the contrary in dementia praecox there is a mental standstill which is responsible for the neglect of his work. Another point is that in dementia praecox, especially of the hebephrenic form, it occurs at an earlier age and runs a more rapid course, and is dissimilar in these respects to alcoholic dementia. It requires years of drinking to produce mental deterioration in an alcoholic; before the age of forty it is very rare to find dementia which can be ascribed solely to alcohol. A special stamp is given to dementia praecox through a series of rather characteristic symptoms, which are

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recognized as hebephrenic, catatonic and paranoid symptoms, namely: eccentricities, mannerisms, stereotypies of action, speech and writing, negativism, automatism, catalepsy, impulsive tendencies, outbreaks of anger without apparent cause, compulsive ideas, silly laughter, fleeting hallucinations and loosely organized delusions, not only allopsychic but in contradistinction to the alcoholic psychoses, also those of auto- and somato-psychic nature. When, however, the special signs of dementia praecox are not present the differentiation from alcoholism and alcoholic dementia is not so easy. Especially difficult is the differential diagnosis from the so-called simple dementia, that is, cases of dementia praecox which run a simple course without the well-defined hebephrenic, catatonic and paranoid symptoms; such cases, as also the simple paranoid form, are in their earliest stages very easily confused with those of alcoholism. Among the cases of Diem (3) there were a number who had their affection for a long time and had been diagnosed as alcoholic dementia. In these forms of dementia praecox there are not to be found those symptoms which are quite characteristic of the alcoholic phychosis, namely: the labile disposition, the alcoholic humor and the alcoholic expansiveness.

The praecox cases may show, in spite of some deterioration, an unimpaired memory. Their dementia does not improve in spite of many years' sojourn in an institution and abstinence from alcoholic drink, but most cases deteriorate. It is entirely different with the alcoholic dements, whose condition is the result of chronic intoxication. If the alcohol is stopped they will not deteriorate further but will, when not influenced by other factors, improve to a certain degree in the course of their life. The well-known physical signs of chronic alcoholism, namely: the alcoholic facies, tremor, the morning vomiting, the heart, liver and kidney affections, the symptoms of neuritis, and the dulling of sense perceptions continue for two or three months or longer after the patient is admitted to the hospital. As further differentiating dementia praecox from alcoholism, he refers to the memory defect of the alcoholic, which stands out prominently as has been shown by Rüdin. The alcoholic ideas of jealousy are manifested by their being isolated and of narrow fixity.

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The differences between the chronic alcoholic psychoses and dementia praecox are then stated by him as follows: The Korsakow's psychosis, alcoholic pseudo-paresis as well as alcoholic senile dementia do not as a rule resemble dementia praecox and thus there is not much difficulty in separating them. The chronic hallucinatory dementia of Kraepelin presents the greatest difficulty in making a differential diagnosis. Kraepelin has recognized the high degree of similarity of the hallucinatory dementia of the alcoholic with certain terminal states of dementia praecox, and the difficulty in separating these two conditions. He states that the patients suffering from chronic hallucinatory dementia maintain a great mental and emotional activity, remain accessible and natural in their demeanor, show the characteristic alcoholic humor, and do not furnish the manifold and peculiar will disturbances of the catatonic.

Concerning the influence of alcohol on dementia praecox he shows that the symptoms of praecox are increased by the alcoholism and that the usual good memory of these cases is seriously affected. As to the influence of dementia praecox on alcoholism, "one has similar retrograde changes; there is also diminished cerebral resistance to the influence of alcohol."

In a résumé of his work Graeter states: That in eleven cases of dementia praecox combined with alcoholism which were studied by him, there was not a single one whose nature was recognized from the beginning, and incorrect diagnoses were made in twenty-four instances during the course of their treatment, to the detriment of not only the patients themselves, but in so far as institutions for inebriates were concerned, also to the detriment of their fellow patients. In many instances these cases have previously been considered delirium tremens, acute alcoholic paranoia, chronic alcoholic insanity, alcoholic dementia, melancholia, etc. According to his view many diagnostic errors could have been avoided through a careful study of the anamnesis. He further states that the hitherto casuistic contributions concerning alcoholic psychoses, as well as the ordinary anamnesis of the alcoholic in the institution, leaves much to be desired. By supplemental studies he could in some instances establish the fact that the reported deliria and alcoholic hallucinoses from which the

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diseases were supposed to have developed were in reality only the initial excitements of a beginning praecox or intercurrent exacerbation of the same.

In the symptomatology of alcoholism combined with dementia praecox three groups were differentiated. In the first group he places those cases which show a symptomatology which may very well belong to alcoholism or dementia praecox and which are exaggerated in proportion to the degree of alcoholic intoxication. In this group he does not attempt to differentiate them as belonging to either psychosis but is inclined more to alcoholism on account of the great influence alcohol has on the symptomatology. In the second group he places those cases whose symptoms are modified to a less extent by the alcohol and which of themselves are not specific for dementia praecox. But just in this respect they are of differential diagnostic significance, because they occur also in other psychoses, but, according to his experience, and that of others, seldom in purely alcoholic psychosis. Those are the auto- and somato-psychic delusions, and also the hallucinations of touch, smell and taste. In the third group he places those cases whose symptomatology is directly opposed to the nature of the alcoholic, namely: those symptoms which depend upon the general inhibition or paradoxical and special blunting of the volition, and in which the symptoms become over-shadowed by the alcoholism in direct proportion to the degree of intoxication but which reappear on the wearing off of the effects of the latter. This group can be definitely differentiated from the pure alcoholic by the tendency to concealment of the delusions and hallucinations and by the absence of the tendency to conceal the alcoholic habit, and any lapse of the memory which may be present—tendencies which are in sharp contradistinction to those of the alcoholic. In other words, the patient suffering with a pure alcoholic psychosis is, as a rule, quite willing to discuss his hallucinations and delusions; he is not seclusive and does not give evasive and reluctant answers to questions asked him. While he may acknowledge that he has been drinking he usually denies that this has been to excess. On the contrary the patient suffering with dementia praecox is usually more or less seclusive, gives evasive and reluctant answers and

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may refuse to answer questions concerning his delusions and hallucinations; a lapse of memory is of no consequence to him, indeed he may simulate it. He will talk fully about his alcoholic excesses, the amount of alcohol he took on each occasion and the frequency of these excesses.

This subject is a most important one from the standpoint of the military surgeon, as dementia praecox is the most frequent form of mental disease observed in cases admitted from the military service to the Government Hospital for the Insane. In going over many case histories and making a further personal study of fifty-nine cases of dementia praecox, it was noteworthy with what frequency alcoholism was given as an etiological factor in the production of this form of psychosis. Indeed, if the patient reached the hospital in the early stage of his disease, it was not always possible in those cases of dementia praecox combined with alcoholism to make an accurate diagnosis. The history in these particular cases, especially if the patient had been sent here from remote military posts, would indicate that the prominence of the alcoholic symptoms at the onset of the psychosis had usually resulted in a diagnosis of an alcoholic psychosis. In the fifty-nine cases studied there was a history of alcoholic excesses in twenty-one cases, or 35.6%; 6, or 10% were mixed alcoholic and praecox cases. It is true that acute and subacute alcoholism more frequently complicated these cases than the chronic form.

Brief summaries of case histories illustrative of a few of these mixed cases are here presented.

Case No. 1. Summary of history of Private B. A., admitted August 31, 1910; age 25. Father chronic alcoholic and morphine habitue. One sister insane; one brother chronic alcoholic. Patient was backward in his studies at school, was a confirmed truant. Left school at the age of twelve and worked at various occupations, which he frequently changed on account of his inefficiency and drunkenness. Claims to have had an attack of delirium tremens before he enlisted in the Marine Corps, which was in 1907. He was sent to Panama, where a few months after arrival he was absent without leave. Was later apprehended and tried by court martial and sentenced to a term in the guard house. In a short time he again deserted and went on an alcoholic debauch. Was finally apprehended and tried by general court martial, was found guilty and sentenced to nine months at the Naval Prison at Portsmouth, N. H. In 1909 at the expiration of his prison term he enlisted in the United States Army under an assumed name. During his service of about a year he

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had several courts martial, mostly on account of drunkenness, absence without leave, disobedience of orders and insubordination. He received a head injury while drunk, prior to this enlistment. He was unconscious for a few hours but there were no apparent after-effects. Medical certificate stated that he had always been considered queer by his fellow soldiers. Shortly before admission to the military hospital he visited the commanding officers' quarters, saying that he was mistreated and persecuted. Patient changed his name, claiming that the world changed and he also must change his name. Had fleeting delusions. He was impulsive, destructive and talked abusively. Since admission to the Government Hospital for the Insane the patient has had visual and auditory hallucinations, the latter predominating. He appears apprehensive and claims that he is being persecuted, that he has been drunk a hundred times and that he is accustomed to drinking one quart of whiskey daily and that he has had delirium tremens. The voices he hears talk to him directly, calling him vile names. The people around him whistle and make fun of him. There is no evidence of hallucinations of smell, touch or taste. Patient is oriented in all spheres, his memory is fairly good. He has absolutely no insight into his condition. Reasoning and judgment are impaired. At the present time this patient still retains his hallucinations and delusions of a persecutory nature. He is impulsive and occasionally strikes attendants. He is seclusive, irritable, resents being questioned, frequently laughs to himself and behaves in a silly manner.

Case No. 2. Summary of the history of Private A. W., admitted December 11, 1909. Medical certificate states that family history is unknown. Patient used alcohol and tobacco excessively. In August, 1908, the symptoms were those of complete disorientation, delusions of persecution, hallucinations and dementia. Probable causes—hereditary taint and excessive use of alcohol. Years of service 3 7-12. One paternal uncle and three paternal aunts are said to be of highly nervous temperament. One paternal and one maternal uncles were alcoholic. Father is temperate. Mother probably died of tuberculosis. Patient was in very delicate health for the first two years of his life. Claims he did well at school, where he remained until eighteen years old. At an early age he began alcoholic excesses; was frequently drunk before fifteen. As he grew older he continued to indulge freely in alcoholic stimulants. He enlisted in the Army at the age of twenty-two. His trouble began in the Philippines. He went on frequent debauches. Was tried by court martial three or four times. He conceived the idea that some one intended doing him harm; later auditory and visual hallucinations became manifest. A month later he was sent to the Hospital, where the hallucinations continued. He was in the Hospital two or three times, recovered and was restored to duty. He immediately began drinking as heavily as ever. The hallucinations returned and he was absent without leave. Upon his return he was again placed in the Hospital and shortly afterwards was

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ordered to the United States. His memory for this second attack is clouded. He recalls having had hallucinations while in the Hospital at Presidio. During his early days at the Government Hospital for the Insane he was seemingly confused, was morose, did not wish to be questioned, was extremely indifferent, said he wished to die, sat for a long time in one position. He gradually improved and in the latter part of March, 1910, the disturbances apparently left him. He had an attack of malarial fever while here and appeared during that time unusually dull and lethargic. On November 7th he was very hilarious and behaved in a silly manner for several hours. On December 12th, 1910, he was discharged with a diagnosis of dementia praecox combined with alcoholism.

Case No. 3. Summary of history of Private P. H., admitted December 11th, 1909, at the age of twenty-seven. Parents alcoholic. Patient attended school between the ages of six and eight years, then worked in the mines until he enlisted in the Army. The character received at the expiration of his first enlistment was "very good." He has had seven years service in all, during this time he has had three summary courts martial for absence without leave and three for drunkenness. He served in the Philippines for five years and during that time claims to have had malaria nine times; has had dengue fever; gonorrhoea four times and contracted syphilis in 1905. He claims that he drank to excess while in the Philippines, often consuming twelve bottles of beer and four whiskies daily. In October, 1909, he began to hear voices, which he thought were from God; he thought that he had sinned and that the Lord would not forgive him. Patient had lost considerably in weight, slept poorly and dreamed a great deal about devils and hell. He felt electricity in his legs and arms. He was admitted to the Government Hospital for the Insane December 11th, 1909. At that time the patient was very much depressed and refused to eat or talk; it was necessary to tube feed him during the first week of his residence here. He refused to talk but on several occasions expressed his wants in writing. Ofttimes assumed peculiar attitudes. Patient began taking his meals regularly about the beginning of February, 1910; about the latter part of the month he began to cry, said he had given up hope and asked the doctors to tube feed him again. He was tube fed for about a week. At the beginning of March, 1910, he became pleasant and agreeable, took his meals in the dining room and helped with the ward work. He was very quiet and did not have much to say to anyone unless addressed. The medical certificate stated that patient used alcohol to excess, that the first symptoms of the disease became manifest in October, 1909, when he suffered from acute alcoholism (hallucinations). Since the acute stage has passed, hallucinations have continued. His symptoms are diminished mental activity, hallucinations of hearing, delusions of persecution, refuses to take food for days at a time and refuses medicine. Probable cause hereditary taint and excessive use of alcohol. The diagnosis that accompanied the patient was given as alcoholic dementia. The patient's condition continued to improve and

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he was sufficiently recovered to be discharged from the Hospital in March, 1911. The diagnosis made at the hospital conference was that the patient had been suffering from a catatonic form of dementia praecox complicated by alcoholism.

Case No. 4. Summary of history of Private E. K., admitted June 14th, 1910; aged twenty-five years. Medical certificate states that the patient's father died of consumption; that the patient used alcohol to excess. The first symptoms of his mental trouble became manifest in February, 1910, when he without provocation attacked a fellow prisoner in the guard house; previously he had had delusions of persecution. The present symptoms of insanity were given as delusions of persecution, suicidal and homicidal tendencies.

Additional history shows that the patient was backward at school; was sent to a reform school for one year on account of truancy and on account of his association with bad characters. After leaving school he worked at various occupations, until he enlisted in the Army in 1908. He states that he was perfectly well when he arrived in the Philippines in August, 1909, but shortly after began drinking to excess. Since enlistment he states he has been a very heavy drinker, characterizes his tendency in this direction by the phrase "like pouring it down a sewer." He recalls when he was first sent to the Military Hospital and believes it was on account of his having lost his mind. He states that there were times when he did not know what he was doing; that when intoxicated a "spell" came over him, he became noisy, fought with everyone who came near him, destroyed property. He remembers all this but does not know what caused him to do it. He thinks that the whiskey may have caused him to act peculiarly. He states that he attempted to commit suicide twice by hanging and once by trying to cut his wrist with a lead pencil. He states he attacked a fellow soldier because the latter called him bad names. He recalls that when he was a patient at the Presidio he had very severe headaches, which drove him "crazy," and that he thinks that they were due to an old fracture of the skull. On admission to this hospital patient was fairly well oriented for place and person but imperfectly for time. Memory defective. He was emotionally indifferent. Insight into his condition was entirely lacking. Hallucinations and delusions: Patient states that at the post where he served he heard voices call him names and threaten to kill him. At the Presidio he refused to eat because the hospital corps men were putting poison into his food. At the present time the patient has a number of bizarre, somatic delusions, which he tells so rapidly that it is hard to follow him. He also has a number of delusions of a sexual nature. The patient remains in the institution and shows evidence of marked deterioration. The various hallucinations and delusions are as numerous as ever.

Case No. 5. Summary of history of Private R. W., admitted August 29th, 1910; age thirty. One brother died of tuberculosis; one brother is a chronic alcoholic. Patient was somewhat backward at school. At the

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age of fifteen years left school and went to work. Changed occupations frequently; gives as his reason that work was scarce or that he could not get along with his employers. He led a hobo's existence for several months and finally arrived at San Francisco, where he enlisted in the United States Army in 1902. He received three courts martial during the first enlistment on account of being drunk and disorderly. During the second enlistment, while stationed in the Philippines, he was sent to the Division Hospital for what he called "nervousness." He had been drinking heavily at the time, would occasionally awake suddenly with a start and imagined that people were persecuting him. He states that the Company barber told him that he had seen a lizard while asleep and that it looked like the patient's mother. He remained in the hospital for several months, when he was sent to the United States. He believes that he had some form of insanity at that time. He was discharged at the expiration of his term of service and re-enlisted in 1908. During the summer of 1910 while at a manoeuver camp he began to suffer from auditory hallucinations, imagining that he heard voices outside the camp calling him bad names. Also thought that his comrades "had it in" for him. When asked if he were being persecuted while en route to this hospital he answered "Yes, they kept up the same old line of conversation." He thought that the voices of his comrades accused him of unnatural practices. Patient states that he did not drink anything at the camp but had been indulging rather freely just prior to his going there. The medical certificate states that the patient used alcohol and tobacco to excess. Four years ago during a previous attack he developed delusions of persecution, imagined that he was the object of a conspiracy, also heard unpleasant voices. It could not be learned whether he had attacked anyone at that time. At the present time he has auditory hallucinations and delusions of persecution. Without provocation he strikes the attendants and patients on the ward. Probable cause—excessive use of alcohol. On admission to the Government Hospital for the Insane, patient's general memory appeared to be fairly good. He was partially oriented. Insight into his condition was entirely lacking. Emotionally he gave the impression of being depressed. He was very suspicious and apprehensive He denied hallucinations but acknowledged that he had heard voices prior to admission here. He continued to think that people had been persecuting him. He reacted poorly to the intelligence test. A note made one month after admission states that he is more or less indifferent, stupid and apathetic. He does not make any requests for any attention and he receives the attention without comment. He knows that he has been ill and ascribes his trouble as due to too much alcohol. He has an amnesia or probably simulates an amnesia for many of the early manifestations of his mental disturbance prior to his admission here. On admission the patient's condition resembled very much that of alcoholic hallucinosis but during the time that he has been under observation here some features of dementia praecox have been noted. He continued to

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have absolutely no insight into his condition. On April 25th, 1911, he had so improved that he was presented at the hospital conference and discharged. A diagnosis of dementia praecox combined with alcoholism was made.

Case No. 6. Summary of Private C. S., admitted February 20th, 1910; age thirty-nine years. Father drank to excess and was inclined to be irritable. One sister developed mental disease at the age of eighteen, the nature of which the patient does not know. Patient did fairly well at school. Enlisted in the United States Army in 1891 at the age of twenty-one. During the first four enlistments he received a character excellent on each discharge. He had been a non-commissioned officer during all these enlistments except the first. No summary courts martial. During the fifth enlistment patient received character excellent; had two summary courts martial both brought about as a result of alcoholism. He was a sergeant during this enlistment. During the sixth enlistment was a private. Up to this enlistment his services appear to have been efficient. He received one summary court martial for being absent without leave. In 1909 after an alcoholic debauch he claims he was given "knockout drops" in San Francisco, was robbed and missed the transport to the Philippines. He then continued to drink heavily for three or four days, until he attempted suicide. He was then sent to the Presidio Hospital, where he was yelling and struggling. Here he heard voices accusing him of unnatural practices. In a few weeks he had apparently recovered and was restored to duty and was sent to join his regiment in the Philippines. He now acknowledges that he still heard voices at that time. During the voyage to Manila he continued to hear voices. In the Philippines he denies drinking to excess; would occasionally take a glass of beer. On two occasions he thought of committing suicide but each time something prevented. He told his company commander that he intended to commit suicide. The voices were saying, "If I were in his place I would end my life." He states that for years previous to this when he felt depressed after drinking, similar thoughts to end his life would come to him. He was sent to San Francisco and during the voyage continued to hear voices. In the Presidio Hospital he was in two or three fights because he thought other patients were calling him bad names. Medical certificate states that one sister is insane; father is alcoholic. His trouble began in San Francisco when he was drugged and robbed, in July, 1909. Delusions began soon after he was confined to the guard house. Fixed delusion that everyone is secretly accusing him of being a sexual pervert. No impairment of intellect. Cause not known. Began after a service of about fifteen years as a soldier. On admission to the Government Hospital for the Insane patient was well oriented in all spheres. His general memory was good. No apparent intellectual defects. Insight into his condition was entirely lacking. Emotionally he was depressed. He had various ideas of reference and persecution. Auditory hallucinations were marked. Patient showed no lack of attention or indifference. He was again examined

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April 11th, 1911. His condition showed little change. The hallucinatory experiences are as active as ever. He is seclusive; very seldom speaks to anyone unless addressed and never smiles. He still maintains that these hallucinatory experiences are quite real. He claims that the patients around him give him considerable annoyance by assuming peculiar attitudes. He states that the people talk about him indirectly, although on rare occasions he has heard voices talking directly to him. Emotionally the patient shows some instability at times, especially when telling of his hallucinatory experiences he becomes flushed in the face and his voice becomes tremulous, etc. At the present time it is difficult to make a definite diagnosis in this case. The history prior to admission and during his early days here would indicate that he was suffering from an alcoholic hallucinosis. It is believed that the diagnosis rests between chronic alcoholic hallucinosis and dementia praecox combined with chronic alcoholism; and that time alone will make the differentiation. A symptomatic diagnosis of depressive hallucinosis might be made but would not aid in solving the problem. There are probably more features in favor of an alcoholic psychosis than of a dementia praecox. The history would indicate that the patient started off with the excessive use of alcohol and drank persistently. He does not show what are considered decided marks of deterioration, such as incoherence, silly speech, silly laughter and disturbances in the volitional field. His emotional reaction is very acute, he now feels the hallucinatory experiences as keenly as at first. His reaction to these by three attempts at suicide would tend to further support the diagnosis of an alcoholic psychosis. There is no apparent lack of attention or indifference. The onset at the age of thirty-eight is somewhat later than we would expect in the average praecox. The auditory hallucinations have been so marked from the onset and the voices have spoken to him more indirectly than directly, which is a diagnostic point made by some observers in favor of an alcoholic hallucinosis. There was at the onset evidence of visual hallucinations but they were very probably alcoholic in origin. Furthermore there has been no evidence of hallucinations of smell, taste and touch, which rarely occur, according to Graeter, in pure alcoholic hallucinosis. A further diagnostic point in favor of an alcoholic psychosis is the absence of auto and somato-psychic delusions, which we may find in praecox. The patient denies that he has been a steady drinker and admits that only occasionally did he indulge in alcohol to excess. This psychosis has now lasted about two years and is becoming so prolonged that it may later show more clearly that it is dementia praecox but we cannot say so at this time. These cases of chronic hallucinosis in which the alcohol may act as a disintegrating factor frequently turn out to be dementia praecox.

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THE BEDBUG IN A NEW ROLE.*

By Passed Assistant Surgeon R. E. RIGGS, U. S. Navy.

"Red-bug is my saddle horse,
Seed-tick is my mule,
People see me riding by
Say I am a ———."

SO sang the young people a generation ago, and although the rhyme was wholly devoid of meaning, still it had a fascinating swing to it, and for that reason was as popular as "My Sweetheart Is A Man In The Moon" became some years later.

If now, after many years, I may be permitted to revive this half-forgotten song, and substitute bed-bug for red-bug, and cockroach for seed-tick, you will have paraded before you my twin brothers-in-iniquity:

"*Bedbug* is my saddle horse,
Cockroach is my mule,
People see me riding by
Say — — — ——."

But I hope my audience will be a little more complimentary in its outspoken sentiments, or better still, reserve its judgment until I have saddled my steeds with suspicion enough to negative their seemingly insignificant characters.

The bedbug and the cockroach have little in common, unless it be a similar color, retiring habits, and the common faculty of making themselves a nuisance around the premises. The one is a true animal parasite, with an exclusive taste for human blood; while the other is merely an insect, with a voracious appetite for inanimate food in general—luckily including phosphorous paste. The cockroach, when it ingests disease germs, does so incidentally while foraging for food; but the bedbug abstracts blood directly from its victims, sick and well alike. The first can only transfer infections through its droppings, or by mere contact with its

*Read by title at the 20th Annual Meeting.

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contaminated body; but the second, armed with a long, powerful three-pronged proboscis, sticks this through the skin, and not only takes out blood, but, in my opinion, expresses some of its own body contents into that of its victim. One has only to look at this insect with its long nozzle and flat belly to recall the shape of the old-fashioned blacksmith's bellows; nor does it strain the imagination to conceive that, like this apparatus, it likely enough works both ways when in action. Whether or not the bedbug is equipped by nature with a salivary system, similar to that of the mosquito, whereby infectious diseases may be transferred, is open to discussion, and can be settled by inquiring of the zoologists. The thing which concerns us as sanitarians is the simple fact whether it does or does not transmit disease.

That it does busy itself as a repeater in typhoid fever I am convinced; and while the evidence I have to offer is wholly circumstantial, there is enough of it, in my opinion, to convict the unclean pest.

The cockroach does not properly belong in this discussion, save that, through a peculiar chain of circumstances, it was this insect which indirectly brought suspicion on the bedbug through its activity in spreading an infection of para-typhoid fever on board a ship of war some seven years ago. Caught in the act, its destruction offered the only solution to a very perplexing question in etiology; and so it may be the more rapidly understood how it was that my mind was already prepared to entertain prejudice against the bedbug also, when, a year ago, I encountered a virulent outbreak of typhoid fever under conditions which precluded the likelihood that the infection could have spread by any other means. As bearing on the later experience, therefore, it would seem expedient to first introduce the matter of the cockroach:

In the spring of 1904 I joined the cruiser *Newark* at Colon, and found that there was then, and had been for some time, typhoid fever on board. One case had succeeded another with great regularity, and these continued to spring up ever so often, with the regularity of clockwork. And this, notwithstanding the fact that all liberty had been long denied the crew, in the effort to minimize to the least possible degree the possibility of picking up the infection ashore. Food supplies were closely scrutinized,

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fresh vegetables and fruit interdicted, and the water supply altogether distilled on board. Strong disinfectants were regularly applied to the decks and other exposed surfaces, and, in short, every known precaution was resorted to in the efforts to suppress the disease. Flies were not present, nor could any fault be found with the sanitary condition of the ship. All these measures proving futile, it may be easily imagined that the medical department was in despair. We were almost tempted to hark back to the old belief in *de novo;* but were saved this disgrace through a revelation that was almost an accident. It was some comfort to have exhausted all the conventional theories, since we could again start from the beginning, and reason the matter out with minds freed from the uncertainties which so frequently continue to shroud the endemic foci of typhoid fever.

Generally, I have found that such thoughts as seem worth while are most likely to come to a man at night, when all the bustle and activity of the day are at an end; and thus it happens that I am given to nightly prowlings when in doubt or perplexity. Some such impulse led me to make nightly visits to the sick bay, and I was struck by the great number of cockroaches which were to be seen running around. Just abaft the sick bay entrance there were food and dish lockers, and the insects were observed busily plying between the two compartments. That there might be some connection between these scavengers and the persistence of the typhoid seemed plausible enough. Once formulated, the suspicion formed the basis of an active campaign which was at once inaugurated to compass their destruction.

With the disappearance of the cockroaches, the disease came to an abrupt end.

But before killing any, in order that the theory might be substantiated to whatever degree practicable, several of the older inhabitants were caught around the sick bay, and bottled up for laboratory experimentation.

The examination was made at the Naval Medical School Laboratory, to which the bugs had been sent, with an explanation of the circumstances, and a report was, in due time, received.

In interpreting the findings of the laboratory, it must be borne in mind that at that time the more accurate bacteriological meth-

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ods now in vogue were not perfected, and due allowance made for the inconclusive findings in respect to one of the two organisms isolated:

The report stated that from the macerated bodies of the cockroaches examined two organisms had been isolated; the one identical with typhoid in all respects except that it failed to give the Widal reaction with the blood of true typhoid fever; the other identical with the streptococcus erysipelatus.

In respect to the typhoid-like bacillus isolated, it likely was the para-typhoid organism, since all of the cases were identical, "clinically like mild typhoid fever,"* and such that any well-informed clinician would now unhesitatingly pronounce para-typhoid fever. It is, further, more than a coincidence that there was a patient quite ill with erysipelas in the sick bay when the cockroaches were captured.

Through this experience, then, I was already suspicious of bugs along these lines, when, in 1910, I encountered a virulent outbreak of typhoid fever, under conditions so peculiar in respect to general sanitary surroundings, that I was able to light upon the bedbug as an etiological factor in the mysterious transmission of the disease from the first case to the succeeding ones.

It has been a source of constant regret that advantage was not taken of this unique opportunity to prove by laboratory methods that the bugs harbored the infection; but in the face of an emergency which threatened the very life of an important military post, this was not practicable. In further extenuation of this oversight, it may be stated that I could not have been expected in the beginning to foresee the abrupt and complete success which was to attend the destruction of the parasites within the established focus of infection. And so it is that the evidence offered in this instance is wholly circumstantial, though—to me—convincing.

The military post mentioned was situated upon an island, wholly isolated from any adjacent territory which might be suspected of harboring typhoid; controlling the traffic within its territory, as also its food supplies; owning and operating its own

*Osler.

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unshared water supply; fully equipped with all and adequate sanitary arrangements; and its history was free from cases of this nature. If allowed my choice among places supposed to be ideally sanitary, I should have unhesitatingly given this first place. Notwithstanding all this, and suddenly, like a bolt from the clear sky, typhoid descended among us and struck down five cases with such steady aggressiveness that it began to look as if the whole garrison would be victimized.

Confronted by an epidemic disease, it is the first and all important duty of the sanitarian to trace the origin and stamp out the disease, rather than to become wholly engrossed in the care and treatment of the sick themselves. So I at once set about an investigation of the probable sources of the infection, only to be balked at every turn, as indicated in describing the sanitary arrangements of the station. The water, the food, flies, the drainage and sewerage, were taken up one by one, only to be excluded. Lastly, an associated analysis of the cases themselves was undertaken, and some peculiar facts came to light: the first case was a prisoner who had been in close confinement in the brig for six weeks before the onset of the disease; the second case was also a prisoner, sleeping in an adjoining cell, while the three remaining cases, while not themselves prisoners, had been also sleeping in the guard house while on duty among the guard. Evidently, then, the brig was the focus of infection, and all these cases bore a more or less intimate relation to the first case to develop. It has been mentioned that this first case had been in prison for six weeks before he became ill; and at first glance it would seem that the incubation period was entirely too long, if it was to be supposed that he had picked up the infection while at large. Fortunately for my theory we are getting to be a little more lenient in these matters, and a little less willing to be ruled in our judgments by the hide-bound rules laid down in text-books. As a matter of fact, this man had been captured in a somewhat distant city, notorious for its endemic typhoid, and while in good health when confined, the treatment to which he was subjected was hardly calculated to maintain it; on the contrary, he had become very much run down, and it seems probable that the disease,

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which was lying dormant in his system, took advantage of his generally debilitated condition and declared itself.

Having reasoned it out along these lines, everything pointed to the prison house as the seat of the trouble; and an investigation was therefore made of it. The structure was entirely of wood, and old, though in a fair state of preservation. The interior was one large room, lined with beaded ceiling, and containing cells along one wall constructed out of the same material. This ceiling had shrunk a little, leaving cracks between each board, and these spaces were the lurking places of hordes of bedbugs.

Except in this one respect, little fault could be found with the sanitary condition of the place; for no food was supplied here; running water could be had by the turning of a faucet, but was not habitually drunk by the men, since they preferred the ice water which was plentifully provided in every barracks; and the water closets and urinals were located outside the building.

There was then no factor common to all the inmates, except the air which they breathed, and the bedbugs. Between the two, it seemed most probable that the bedbugs were to blame; and immediate preparation was made to destroy them. The men were moved out, though not their effects, and the building sealed up and fumigated with concentrated fumes of sulphur for forty-eight hours. The parasites were entirely destroyed, after which the ventilation of the building was slightly improved before the men moved in again.

This one precaution was the only measure adopted to suppress the disease, but it proved to be sufficient, for not another case of typhoid occurred; nor has the disease since appeared at that station.

As two additional props to the incriminating evidence already deduced against the bedbug, I wish to cite the cases of a farmer and his wife, and another family living in a small town, all of whom came under my personal care shortly after the experience with typhoid referred to above. In respect to the farmer, he sickened with typhoid several months after his wife had recovered from a mild attack of the disease. In her case the infection had been contracted at a seaside resort, where she had been spending some time and was treated at the plantation house, be-

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longing to the parents, as being more roomy and convenient than their own proper residence. During her illness she occupied the guest room, which was not again occupied until the following summer when the husband took up his quarters there while the wife was away recuperating. The people were intelligent, and had carried out all my directions both during the progress of the case, and after its termination, in the disinfection of the room and the handling of the bed linen and bedding. But it was found later that the sulphur fumigation had been improperly done, and the gas was not sufficiently concentrated to destroy vermin. After the lady's departure, then, the husband moved over to the plantation house, and slept in the same room, and upon the same bed which his wife had occupied during her illness. Shortly he came down with typhoid fever, and had rather a hard time of it. While the sanitary conditions surrounding the premises were none the best, still I had a personal knowledge of the place and the habits of the people which helped greatly in the attempt to fix the responsibility. The water supply was above suspicion, as it had to be brought from a distance in a big jug, and was obtained by special permission from an artesian well which could not possibly have been contaminated. The whole situation was boiled down to one fact only, and that was that he had been infected by sleeping in the room. On the face of it, this statement rather leaves one in doubt as to the precise mode of infection; but, as before mentioned, disinfectants had been used about the room sufficiently, and the linen and bedding looked after especially. But nothing had been done towards the destruction of the bedbugs, and he doubtless served refreshment for the same individuals which had preyed upon the sick wife.

The second case to be described happened also among civilians, and came under my management from start to finish. Here the head of the house first brought home the disease, and it was afterwards contracted by first one, and then another daughter of the family. The original point of infection was in doubt here, since the man was a commuter, going out daily by train to his farm, situated some miles away, and returning into town each night. He had also been away on a visit to the city named in speaking of my first case among the prisoners; and, in fact, he became ill

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while there. But, be that as it may, there was typhoid in plenty, both around the neighborhood of the farm which he owned and in the city which he visited; while there was none in the town in which he lived.

About the end of the second week of his illness, the eldest daughter contracted the disease; and before her recovery a second daughter also came down with it.

The progressive inroads of the disease astounded me, seeing that the general sanitary conditions of the town were satisfactory, and there was nothing about that of the premises in question which differed in any essential point from its neighbors. In so far as the water supply was concerned, this could be excluded at once; for it was pure, and the common supply of the town.

Flies could not be excluded so readily, since they were everywhere present; but it did seem strange, if these were to blame, that no other family living in the immediate vicinity suffered, since the flies had as free access to one place as another, and were not restrained by screening, except to some extent, in the house afflicted. As a general thing, all the dwelling houses were thrown wide open during the summer, and if flies carried the infection, the conditions were certainly favorable for a widespread epidemic among the clustered homesteads. The water question was still less subject to blame, since the whole town was supplied by a common system; and fresh milk was furnished the family by a small dealer whose other customers did not suffer. From the first great care had been exercised in disposing of the stools and urine of the sick man; nor were the ordinary precautions common to the sick room overlooked by the trained nurse on duty.

Speaking both generally and specifically there was no gross violation of sanitation which struck the eye, either about the town or the particular residence occupied by the afflicted family. There was nothing about the domestic practices of the people themselves which could be justly criticised, since they were not only rather above the average in intelligence, but lived in easy circumstances. But during the last night of my ministrations to the father, who was dying from intestinal hemorrhage, I saw great numbers of bedbugs busily crawling around his bed, and I picked them off the shirt waist of the nurse repeatedly as she was bending over

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the patient! On examining the bed of the sick girl, this too was found infested, and the same condition prevailed throughout the three rooms on the upper floor. How a family, otherwise careful of the home, could reconcile itself to a passive indifference to, and tolerance of, these filthy pests remains to me a mystery; but the condition is too commonly seen in some sections of our country to excite surprise.

I do not know that it will be considered an additional argument to state that only one nonimmune member of the family who slept upstairs escaped typhoid fever; while the boys, who slept below, and on the opposite side of the house, remained well. It is a peculiar fact, as I have repeatedly seen, that house epidemics usually end, anyhow, with the third case; but in this instance I am convinced that the escape of the boys was due to the remoteness of their sleeping quarters from the infected rooms.

In conclusion, it may be safely stated that I have woven a rather incontestable mesh of scientific proof against the cockroach as a repeater; and a bit of circumstantial evidence implicating the bedbug also in this character. Indeed, I have written to no purpose, and failed in my endeavor, if I have not fully conveyed the impression that I entertain a deep and abiding suspicion of the bedbug as a potential factor in the spread of typhoid fever. If this is so, the latter is of infinitely more danger than is the food-consuming cockroach, both because of its prevalence in this country, and its intimate association with the home life in our communities.

Conditions being favorable, it is therefore my belief that the majority of house epidemics, such as I have described, are due to the activity of the bedbug. This conclusion does not seem to be out of keeping with the simple explanations which have been found underlying many of the century-old mystifications in etiology; but is, like them, simple and natural, not complicated and mysterious. Looking back on many cases coming within my own experience, I am unable to see any other explanation which is so simple and convincing, and, at the same time, plausible, as accounting for the repeated appearance of typhoid fever when once it had gained a foothold among the family.

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The importance of this observation, if broadly substantiated, can hardly be overestimated; for while it is undoubtedly true that typhoid is becoming less prevalent each year in well regulated communities, I have seen no marked difference in the number successively stricken among the family units once the disease has been brought into the home, in spite of the general knowledge of the use of disinfectants possessed by the laity. The one and only exception to this spreading habit which I saw in the different communities in which my practice lay during the year was that of a youth who had come home sick with typhoid, and was the only member of a large family to suffer. But these people did not allow a single bedbug in the house.

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OCULAR DISEASES INCIDENTAL TO ADVANCED LIFE CONSIDERED IN CONNECTION WITH CLAIMS FOR PENSIONS.*

By L. WEBSTER FOX, M. D., LL. D., First Lieutenant, Medical Corps, U. S. Army.

IT is hardly a matter for surprise if an old soldier whose sight is failing him in his declining years should think of his blindness as being in some way connected with the rigors of arduous campaigns he passed through in earlier life. Even if it is not a correct surmise, he may well be excused for so thinking as his earliest impressions in manhood were made in the camp and on the battlefield, after having cast aside all his plans for personal advancement and patriotically leaving his home, his friends and his business pursuits to join in the struggle for the maintenance of the Union. Since then his life has been one long reminiscence of his experiences during the war—of the dangers he had known, his hair-breadth escapes and the hardships he endured. The sacrifices then made by these heroes and their ready renunciation of home ties for the cause are amply sufficient to appeal to the generosity of a grateful nation and to each of them due recognition and recompense should be given.

But many, in addition to the interference with their business pursuits and prosperity, suffered grievous bodily injuries and contracted diseases which were to deprive them of much comfort and happiness throughout the rest of their lives. Such should and do receive a fixed scale of pensions from a paternal Government.

In some cases dimness of vision and fear of impending blindness in advanced life may naturally be associated in the mind of the veteran with injuries he received, or diseases he contracted in the Civil War, and whilst as men we should do all honor to the brave, as ophthalmic experts we must carefully discriminate between the visual defects which can reasonably be associated with the hardships and sufferings of the Civil War, and those which are incident to old age in all classes of individuals.

*Read at the meeting of the National Association of U. S. Pension Examining Surgeons at Atlantic City, N. J., June 3rd, 1912.

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THE CORNEA.

The aged soldier may perhaps be alarmed by the appearance in the cornea of the Arcus Senilis, which eventually forms a complete fatty ring around the cornea. This he may think is due to something which occurred to him during the war until he is informed that is merely a condition incident to advancing years. He may, however, complain of some dimness of vision which is possibly due to a lack of transparency in the center of the cornea.

In examining amblyopic patients particular attention should be directed to the cornea, for we must not conclude from a cursory examination of the cornea that it is faultlessly transparent. It is sometimes most difficult with the unaided eye to detect the existence of very fine, almost transparent, deposits or infiltrations in the center of the cornea, and only by means of very careful oblique illumination or by the use of the corneal microscope can they be recognized. This instrument, whilst it is one of the most valuable of diagnostic aids, is far from being in universal use, and it is surprising what minute changes in the corneal tissue can be detected by its means.

The history of the case and the knowledge of the etiology and natural history of corneal opacities will, of course, determine whether the lesion is of recent occurrence or otherwise.

THE LENS.

The gradual loss of vision which accompanies disturbance in the lens in advanced life might naturally be attributed by the old soldier to something which happened to him long ago in war time, but as a rule the causes of senile cataract are very much the same in a soldier as in a civilian. If the cataract be of a traumatic character, and if the history and appearance of the case support the assertion that it was produced by a blow or a puncture as far back as the early sixties, it would be difficult to disprove that the eye of the patient had become cataractous whilst he was on duty and serving in defense of his country.

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THE RETINA.

Sometimes old soldiers come before us complaining of failure of vision with a view to making claims for an increase of pension where we find the media are perfectly clear but certain changes may be apparent in the retina which are quite sufficient to account for the amblyopia. It is the duty of the ophthalmic surgeon to determine whether the appearances are connected with diseases contracted in the Civil War, or whether they are well recognized senile changes found in soldiers and civilians alike.

Arterio-sclerosis and its relation with syphilis and albuminuria, diabetes and lukemia is becoming better understood than formerly, and when such a condition of the vessels manifests itself in the eye, it needs a very careful investigation to determine whether or not it is a far-off result of something which happened nearly fifty years ago during the Civil War.

In examining the condition of the retina it should be borne in mind that several forms of senile change have been observed in that structure. In the simpler form the retina may appear but slightly veiled, especially about the disk. In another form colloid excrescences of the lamina vitrea of the choroid protrude into the retinal tissue. A third form is characterized by the presence of crystals of carbonate of lime or cholesterin in the retina. In a fourth, numerous plaques are found which coalesce around the region of papilla forming a whitish-yellow ring.

With these senile changes in the retina may be associated synchysis scintillans of the vitreous body, presenting a brilliant appearance. None of these conditions is amenable to treatment. It will be readily understood that these changes of a senile character should not be confounded with others of a pathological character.

GLAUCOMA.

It is quite supposable that a claim for increased pension might be advanced by an old soldier if he found his eyesight failing from glaucoma, but statistics show that there is a somewhat larger number of women than men affected with glaucoma, and it is

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evident that it would be very difficult for a surgeon honestly to believe that a recent attack of glaucoma could be referable to anything that occurred half a century ago.

INFLAMMATIONS OF THE CONJUNCTIVA AND EYELIDS.

It can readily be believed that inflammations of the conjunctiva and eyelids contracted in the time of the Civil War might cause the eyes throughout life to be sensitive to bright light or atmospheric changes—high winds and storms—for although ophthalmic surgery has in recent years made great advances in the treatment of such cases, the conditions under which they were treated in the war time were not of the most favorable character.

PENSIONS.

It may not be amiss to refer to the scale of pensions granted at the present time.

In a personal communication made in 1904 by Lyman F. Ware, United States Commissioner on Pensions, to the author of "Injuries of the Eye,"* it is stated that:

"Pensions by the United States Government for disability due to the eyes are at the following rates:

"Total blindness of both eyes, $100.00 per month; loss of sight of one eye, with loss of eyeball or destruction of same, $17.00 per month; loss of sight of only one eye, $12.00 per month. Partial disability from accident or disease of the eye, $2.00 to $72.00 per month, depending upon the estimated degree of disability in respect to manual labor, estimated empirically."

The time allotted for this paper will not permit of more elaborate descriptions of the senile conditions of the eye, but the object of its preparation will be accomplished if it direct attention to the fact that such senile changes exist and deserve to be considered when judgment is being passed on the eligibility of the soldier to a pension or an increase of pension.

I have not attempted to enter into the particulars of an ophthalmic examination of a pension claimant, as I have already fully

*Injuries of the Eye by Harry Vanderbilt Wurdemann, Md., 1912, p. 884.

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described the different methods of examination and the tests for malingering in a paper on "The Eligibility of Pension Claimants from the Standpoint of the Ophthalmic Expert," which I read at a meeting of the National Association of U. S. Pension Examining Surgeons in April, 1911.

It is somewhat sad to reflect that every year the number of the veterans of the Civil War is fast diminishing and the time is not far distant when their existence will be but a memory with "Requiescat in pace" as a legend above their last resting place.

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A REPORT OF SIX HUNDRED CASES OF MEASLES OCCURRING AT COLUMBUS BARRACKS, OHIO.

By Captain E. D. Kilbourne, Medical Corps, U. S. Army.

An opportunity does not often present itself to observe a large epidemic of measles in young adults living under known conditions of general hygienic surroundings, and with air space, ventilation, etc., accurately controlled.

Such an epidemic has prevailed at this recruit depot for the past eighteen months and has presented features that are considered worthy of record. Captain A. C. Christie, Medical Corps, U. S. Army, in a previous article, (1), reported upon the first six months of the epidemic; December, 1910 to May, 1911. The present report includes those cases and 417 more, making a total of 600, and covers the period from December, 1910 to the end of May, 1912. A few cases of mild nature have occurred since May, but are not included.

When an epidemic occurs in an ordinary community, the disease attacks a varying number of exposed non-immunes and more or less rapidly exhausts itself, but at a recruit depot, where non-immunes are arriving daily and the immunes leaving at short intervals, there is a constant supply of susceptible material and the epidemic is most difficult of eradication. This, and the necessarily close relations of barrack life, together with our inability to recognize the disease at its earliest period of infectivity, account for the continuation of the epidemic at this post.

The average recruit population by weeks, with the absolute and relative incidence of measles, is given in the following table, and is shown on Chart No. 1.

Week ending:	Average recruit population.	Cases.	Proportion of cases.
December 3, 1910	547	0	0%
December 10, 1910	653	0	0%
December 17, 1910	755	0	0%
December 24, 1910	675	2	.20%
December 31, 1910	871	2	.23%
January 7, 1911	1007	3	.20%
January 14 1911	964	20	2.07%
January 21, 1911	910	10	1.09%
January 28, 1911	927	26	2.80%
February 4, 1911	1016	18	1.77%
February 11, 1911	997	15	1.50%

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Week ending:	Average recruit population.	Cases.	Proportion of cases.
February 18, 1911	1019	29	2.84%
February 25, 1911	905	16	1.76%
March 4, 1911	773	16	2.05%
March 11, 1911	809	16	1.97%
March 18, 1911	442	9	2.03%
March 25, 1911	514	3	.58%
April 1, 1911	623	4	.64%
April 8, 1911	584	7	1.20%
April 15, 1911	596	4	.67%
April 22, 1911	658	8	1.21%
April 29, 1911	581	4	.68%
May 6, 1911	500	2	.40%
May 13, 1911	529	0	0%
May 20, 1911	489	0	0%
May 27, 1911	419	2	.47%
June 3, 1911	387	1	.25%
June 10, 1911	403	0	0%
June 17, 1911	412	1	.24%
June 24, 1911	433	0	0%
July 1, 1911	481	1	.20%
July 8, 1911	476	0	0%
July 15, 1911	513	5	.97%
July 22, 1911	772	0	0%
July 29, 1911	785	4	.50%
August 5, 1911	861	0	0%
August 12, 1911	845	7	.82%
August 19, 1911	903	1	.11%
August 26, 1911	940	5	.53%
September 2, 1911	785	6	.76%
September 9, 1911	773	16	2.07%
September 16, 1911	845	6	.71%
September 23, 1911	811	19	2.34%
September 30, 1911	760	1	.13%
October 7, 1911	829	12	1.44%
October 14, 1911	835	3	.35%
October 21, 1911	913	6	.65%
October 28, 1911	786	4	.50%
November 4, 1911	743	7	.94%
November 11, 1911	805	9	1.11%
November 18, 1911	872	7	.80%
November 25, 1911	931	11	1.17%
December 2, 1911	764	9	1.18%
December 9, 1911	956	23	2.40%
December 16, 1911	989	9	.91%
Lecember 23, 1911	949	9	.94%
December 30, 1911	867	13	1.49%
January 6, 1912	964	5	.51%
January 13, 1912	1060	7	.66%
January 20, 1912	941	11	1.16%
January 27, 1912	1132	18	1.59%
February 3, 1912	1130	30	2.65%
February 10, 1912	1062	18	1.69%
February 17, 1912	1095	17	1.55%
February 24, 1912	1012	16	1.58%
March 2, 1912	996	7	.70%
March 9, 1912	1038	9	.86%
March 16, 1912	1062	10	.94%
March 23, 1912	1105	8	.72%
March 30, 1912	1043	6	.57%
April 6, 1912	598	5	.50%
April 13, 1912	569	3	.52%
April 20, 1912	551	7	1.27%
April 27, 1912	571	9	1.57%
May 4, 1912	573	4	.69%
May 11, 1912	567	0	0%
May 18, 1912	632	5	.79%
May 25, 1912	663	6	.90%
79 weeks		600 cases.	

The large recruit population during the cold months was due to the winter influx of recruits, and to military necessity which

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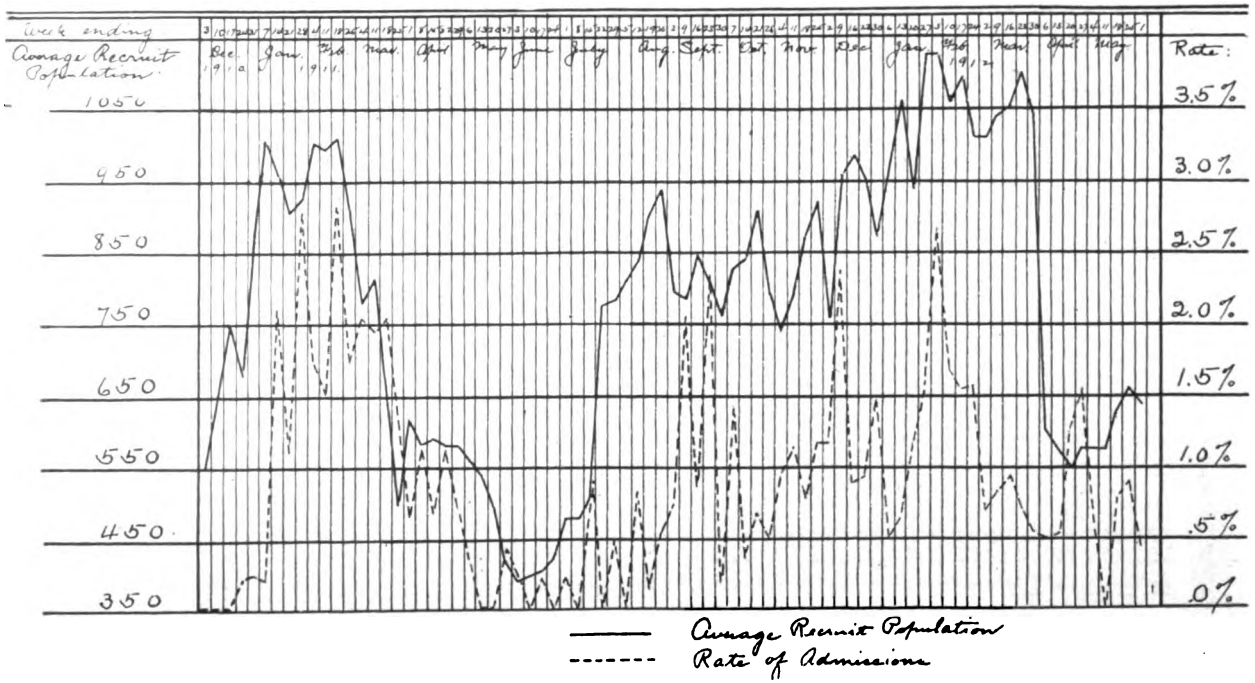
Chart No. 1.



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prevented as large a reduction of the recruit strength as was desired by the sanitary officers of the post. Overcrowding was certainly a factor in the spread and severity of the disease. The crowding was especially pernicious, occurring, as it did, in the cold weather, when proper ventilation is most difficult and the men of necessity spend more time indoors. The barracks allowed a minimum of 700 cu. ft. of air per man, except during the periods of greatest crowding, when an allowance of less than 600 cu. ft. was possible. Frequent inspections were made to see that ventilation was adequate, and the men were required to remain outside for several hours each day, during which time the quarters were thoroughly aired.

It will be noticed (Chart 1) that the curve of relative incidence follows, in general, the curve of the recruit strength; that is, the more recruits quartered in the barracks, the greater the proportion of them affected. After the enforced daily inspection of *all* recruits, instituted July 26th, 1911, the two curves are less similar, there being at times a reduction in the percentage of cases, for which it is thought the inspection, with early recognition of all cases, was partly responsible.

Measles varies extremely in severity, being at times very mild and at others most severe. The benignity of the disease when treated in private houses, with the cases well separated, is in great contrast to its malignity in institutions. Epidemics, also, vary greatly in severity, and even in the same epidemic, the infection, which has been mostly benign, may suddenly become very virulent. This variability has been well shown by our cases. The mortality for the whole period was 30 deaths in 600 cases, 5%.

The deaths occurred with only six exceptions in the months of February and March.

Month.	Admissions.	Deaths.
December, 1910	4	0
January, 1911	61	0
February, 1911	84	4
March, 1911	23	11
April, 1911	24	1
May, 1911	4	1
June, 1911	3	0
July, 1911	9	0
August, 1911	19	0
September, 1911	42	0
October, 1911	26	0
November, 1911	38	1

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Month.	Admissions.	Deaths.
December, 1911	60	0
January, 1912	60	0
February, 1912	63	2
March, 1912	39	7
April, 1912	25	2
May, 1912	16	1
Totals	600	30

The increment of deaths in these months is shown in Chart 2, also.

About the middle of February, 1911, the disease suddenly became very virulent. The early symptoms were severe and complications numerous and fatal. Again in February, 1912, the same increased virulence occurred; of 16 cases admitted from February 16th to February 22nd, 1912, all were severe; only two escaped complications. Among the sixteen cases the following complications were noted:

Severe laryngitis	8 cases	Ac. supp. otitis media	2 cases
Broncho-pneumonia	4 cases	Meningitis	1 case
Ac. fibrinous pleurisy	3 cases	Empyema	1 case
German measles	3 cases	Mastoiditis	1 case
Ac. supp. frontal sinusitis	2 cases	Peritonsillar abscess	1 case

Three deaths occurred—two from broncho-pneumonia and one from acute leptomeningitis. In contrast to these 16 malignant cases were 99 cases from June, 1911, to October, 1911, with very few complications and no deaths.

In April of each year both the proportion of recruits affected and the severity of the cases became markedly less.

Besides overcrowding, I am of the opinion that meteorological conditions are large factors in these changes. During cold, damp and blustering weather the cases were more severe and even individuals would be worse on stormy days. The writer fully appreciates the fact that the influence of meteorological conditions on disease is difficult to determine, but is convinced that they bear a close relationship to a disease like measles in which catarrhal conditions are so prominent.

The average monthly temperature, relative humidity, and per cent incidence of measles are shown in Chart 3. It will be noted that, in general, their curves are similar. The rate curve cor-

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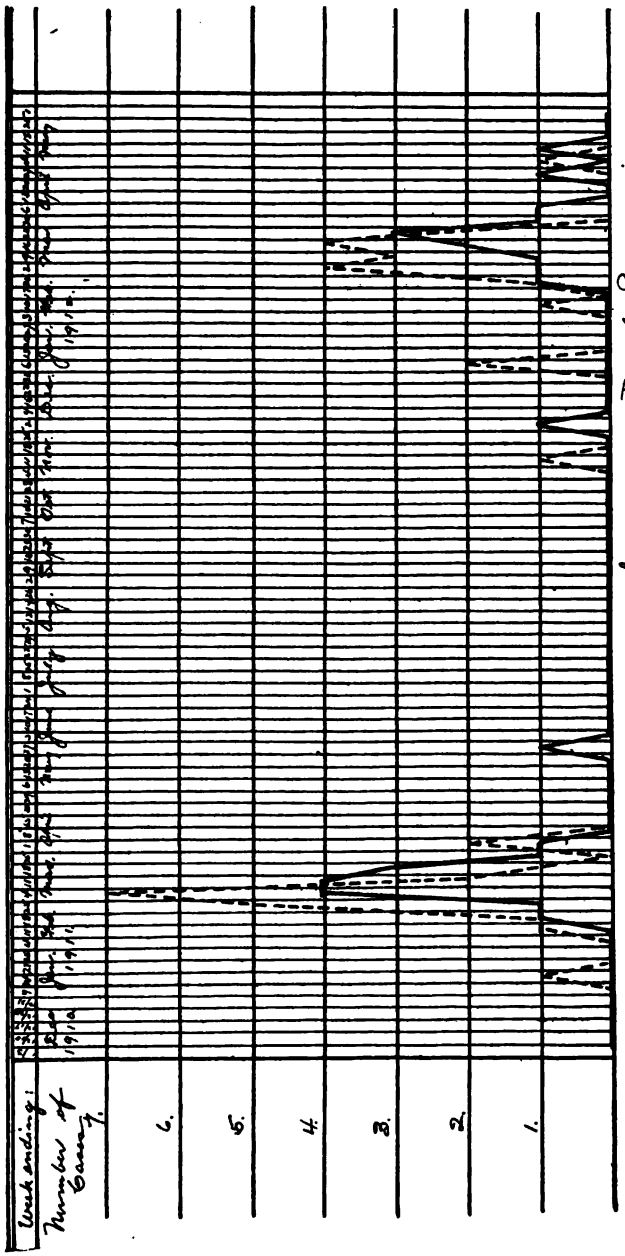

Chart No. 2.

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responds rather closely with that of relative humidity. Absolute humidity is not charted as it seems to have no bearing.

The atmosphere of the post is at all times laden with soot and sulphurous and other vapors due to the close proximity of factories and a railroad yard on the north and west. The locomotives from the latter belch forth smoke that covers the post when the wind is from the north. Trees on that side of the reservation do not thrive. However much the presence of noxious products of combustion may induce catarrhal conditions, and it is believed they conduce largely to such conditions, the wind direction for the different months probably had no relation to the varying severity of our cases.

Prevailing direction of the wind.

January	S. W.	July	N.
February	N. W.	August	S. W.
March	W.	September	E.
April	N.	October	S. E.
May	N.	November	W.
June	N.	December	S.

EARLY RECOGNITION.

During the winter of 1910-11 all recruits who said they had not had measles were inspected daily by a medical officer. Those showing Koplik spots, suspicious choryza or eruption were promptly isolated. In spite of this inspection the cases continued and it was found that about one-half of them occurred in men who claimed to have had measles previously. Many of these men, no doubt, believed they had had the disease, but some said they were immune, to avoid the trouble of attending inspection. To obtain an honest answer, subsequent recruits were asked, when enlisted and before they learned of the daily inspection, whether or not they had ever had measles, and all admitted non-immunes were afterward inspected. Still the cases continued in those who believed themselves immune as well as in those admitting non-immunity. Beginning with July 26th, 1911, *all* recruits were inspected daily, but the cases have continued to occur, because we cannot recognize the disease at its inception.

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Almost without exception the cases were isolated at the first appearance of Koplik spots, and from one to five days before the eruption many were isolated before any spots were present in the mouth, the only symptoms being choryza, cough or conjunctivitis. Undoubtedly measles is contagious several days before the appearance of Koplik spots. Although these spots usually precede the eruption several days, they occasionally appear subsequent to it. To get the cases at the earliest period of infectivity we would have had to isolate all cases of choryza and conjunctivitis, which, of course, would have been impossible.

In no case were Koplik spots absent. They were of great value in distinguishing from German measles which existed during part of the measles epidemic. When the two diseases were present in the same person, which happened eleven times, the appearance of Koplik spots helped greatly in diagnosis.

COMPLICATIONS.

From the clinical standpoint the complications were the most interesting features of the epidemic. They were numerous, as is shown in the following table.

Complications occurring in cases admitted during the following months	Otitis media Ac. Sup'ur'tive		Otitis media Ac. Catarrhal		Mastoiditis, Ac.	Sinusitis		Tonsilitis, Ac. Foll.	Bronchitis, Ac. severe	Laryngitis, Ac. severe	Sero-fibrin. Pleurisy	Fibrinous Pleurisy	Empyema	Rib resect. and drainage	Broncho Pneumonia	Lobar Pneumonia	Pulmonary T. B.	Miliary T. B.	Meningitis	Peritonitis	Appendicitis	Endocarditis, chr.	Myalgia	Neuro-retinitis	Abscess						Alcoholism, acute	Delirium, acute	German Measles	Vaccinia	Mumps	Uncinariasis	Ascariasis
	Single	Double	Single	Double		Frontal	Maxillary																		Pulmonary	Submax.	Retrophar.	Elbow	Buttock	Scapula	Axilla						
1910 December																																			
1911 January	4								6	4																					1		3	3
February	7	2	2		3				3	10	3	2	3	3	19		1		1		2	1	1		2					1	4		1	
March	2	1			1					2	2	3			3										1					4	1			
April	1								1			1						1														3			
May																																		
June																																1		
July																															1			
August	1																																	
September	3									1																1		1						
October	2		1							1																								
November	2	1	3		1					3					1																			
December	9	1	5	1	2	2	1			12	1	2			1	1									1				1	1	1	2	3	1	
1912 January	5	3	1			2		1		15		4			1													1			1	3		
February	7		1		2	6	1	1		17	1	1	1	1	7			2						1		1	1				5	4	4		
March	4				2				1	15	1	3	1	1	10	2	2		1											3	2	1			
April	1	1	3						1	8		1	1	1	2	1															2		1		
May										1		1																							
Totals	48	9	16	1	11	10	2	2	12	89	8	18	6	6	47	4	3	1	3	1	2	1	1	1	3	1	2	1	1	1	9	11	19	18	4	3

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Thirty-seven different complications or coincident infections were observed. I shall consider them in the order of their frequency.

Laryngitis.—Severe laryngitis occurred in 89 cases (14.8%). In two it was very persistent and in one of these became chronic, necessitating discharge from the service. It was absent from April to August inclusive, and most prevalent in February of both years.

In general, the presence of laryngitis, and its severity when present, was a rather accurate index of the severity of the disease. We had no severe case without an accompanying severe laryngitis.

Otitis Media.—Otitis media probably is present in all cases of measles and is caused by direct extension from the naso-pharynx. It may or may not give rise to symptoms.

Forty-eight (8%) of our cases had acute suppurative, otitis media on one side, and nine (1.5%) on both sides. Twelve (2%) had acute catarrhal otitis media on one side and four (.66%) on both sides, of sufficient intensity to produce symptoms. Early paracentesis was practiced with good results. Autogonous vaccines cured several cases with persistent discharge.

Three cases were ultimately discharged on Surgeon's certificate.

Acute mastoiditis followed in eleven cases (1.8%) for the relief of which ten were operated upon.

As with broncho-pneumonia and empyema the cases of otitis were promptly removed from the general ward and segregated.

Several writers have said that suppurative otitis media is rather uncommon in measles. Our experience certainly does not bear out this statement.

Broncho-Pneumonia.—This dreadful complication was present in forty-seven (7.8%) of all the cases, and was fatal in twenty-five, giving a mortality rate of 53% in the cases so complicated. Three cases with prolonged convalescence were finally discharged from the service.

Most of the cases occurred in February and March of both years. On the whole those cases occurring in February and March of 1911 were more severe than those of the following year.

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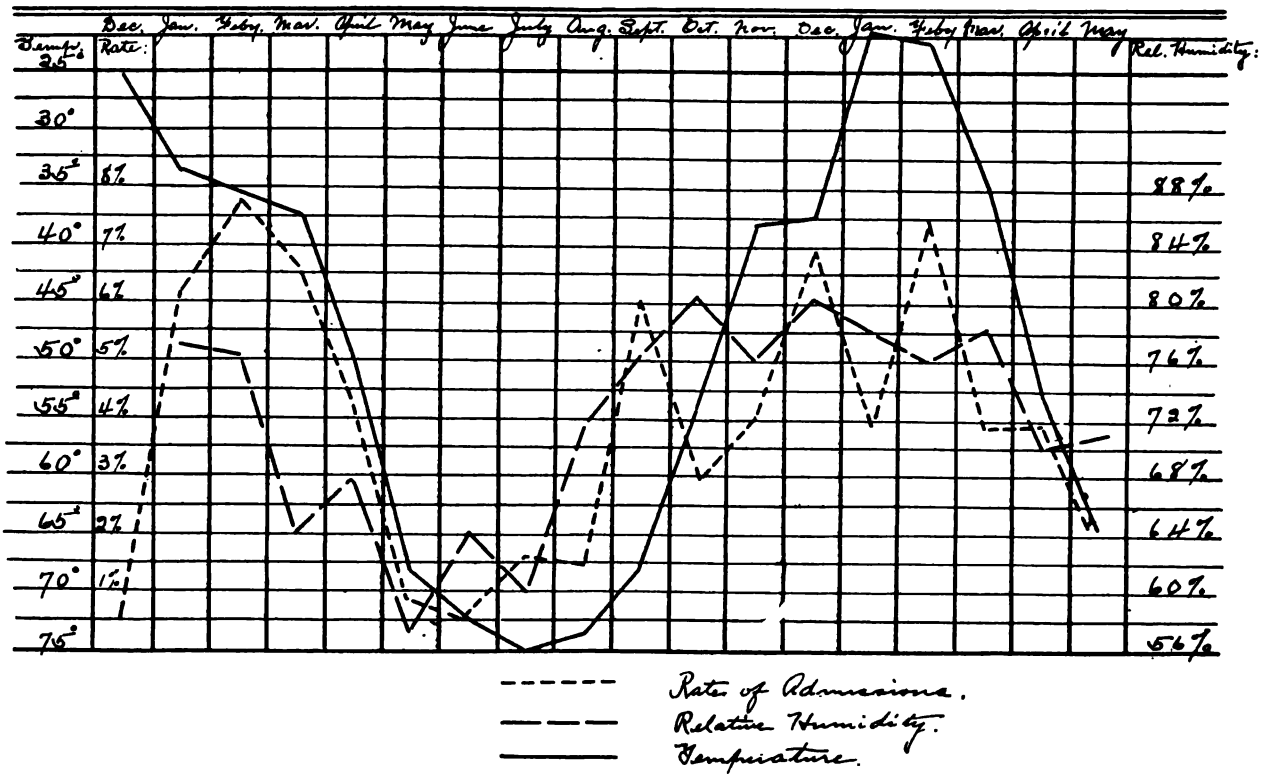
SIX HUNDRED CASES OF MEASLES.

Chart No. 3.



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Even with early recognition and isolation in hospital many cases became severe very early, and rapidly progressed to a fatal termination. The fatal ones were in hospital an average of 17.4 days. The shortest were of seven, eight, and nine days' duration. These short cases were sent to hospital before the appearance of the eruption and kept strictly in bed. They soon became profoundly intoxicated, had early pulmonary infiltration, and, seemingly, had no chance against the overwhelming infection. Autopsy in the fatal cases verified the diagnosis.

Of the twenty-five fatal broncho-pneumonia cases, five were accompanied by empyema; six by sero fibrinous pleurisy, and two by fibrinous pleurisy; four by multiple pulmonary abscesses; one by pulmonary gangrene; two by old pulmonary tuberculosis; one by serous pericarditis and one by general suppurative peritonitis.

Four cases (.66%) of lobar pneumonia were observed—one being in combination with broncho-pneumonia.

Pleurisy and Empyema.—Pleurisy and empyema were present in thirty-two cases (5.3%); fibrinous pleurisy eighteen (3%), sero fibrinous pleurisy eight (1.33%), and empyema six (1%).

In the diagnosis of these conditions the aspirating needle was freely used. All cases of empyema were operated upon, even those with little hope of recovery because of an accompanying broncho-pneumonia, for it was realized that there was no chance of recovery without drainage of the pus cavity. The last few operations were done under nitrous oxide and oxygen anesthesia with much comfort to both the patient and the operator. It is of great value in these cases and a great improvement over local anesthesia. The broncho-pneumonia present precluded the use of chloroform or ether.

The usual bacteria were found in the aspirated pus, pneumococci and streptococci prevailing, with sometimes staphylococci.

Two cases were discharged for disability resulting from chronic pleurisy.

Sinusitis.—The severity of the catarrhal conditions is evidenced by the occurrence of twelve cases (2%) of acute suppurative sinusitis; ten of the frontal, and two of the maxillary sinuses.

Other complications were:

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Severe bronchitis	12 cases	Meningitis	3 cases
Abscesses	10 "	Tonsillitis, ac. foll.	2 "
Uncinariasis	4 "	Severe myalgia	1 case
Ascariasis	3 "	Neuro retinitis	1 "
Pulmonary tuberculosis	3 "	Miliary tuberculosis	1 "
		Ac. Supp. peritonitis	1 "

Nineteen cases of severe vaccinia, eighteen of mumps, eleven of German measles, one of acute alcoholism, and two of acute catarrhal appendicitis occurred during the course of the measles.

A peculiar complication, most evident during the winter of 1910-11, was a persistent delirium. It was not violent, the patient would respond properly to questions, and seemed fairly well oriented, except at night when he would get out of bed if not prevented, perhaps take his bedding with him and make it up on the tile floor of the lavatory, or else sit in a huddled position in the corner of the room for the remainder of the night. It persisted for a week in some of the cases, even for several days after the fever had left.

All complications became much less frequent and severe with the onset of warmer weather which occurred in the later part of March, 1911, and about a month later in 1912.

Ten men were discharged from the service on Surgeon's Certificate of Disability, as follows:

Chronic pleurisy	1
Chronic pleurisy following empyema	1
Chronic otitis media	2
Facial paralysis following mastoiditis	1
Neuro-retinitis	1
Broncho-pneumonia with long convalescence	3
Chronic laryngitis	1

AUTOPSY RECORDS.

The following pathological conditions were found in the fatal cases:

Case No.	Died.	
1.	February 16, 1911.	Broncho pneumonia.
2.	February 25, 1911.	Broncho pneumonia. Multiple pulmonary abscesses. Old healed pulmonary tuberculosis. Chronic endocarditis.
3.	February 26, 1911.	Broncho pneumonia. Pleurisy, sero-fibrinous, right side.

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4.	February 28, 1911.	Broncho pneumonia.
5.	March 2, 1911.	Broncho pneumonia. Old pleuritic adhesions.
6.	March 2, 1911.	Meningitis, acute, metastatic. Otitis media, acute, suppurative, left side. Mastoiditis, left side.
7.	March 6, 1911.	Broncho pneumonia. Pleurisy, acute, fibrinous, right side.
8.	March 7, 1911.	Broncho pneumonia.
9.	March 8, 1911.	Pleurisy, acute, sero-fibrinous, right side. Broncho pneumonia. Pericarditis, serous.
10.	March 9, 1911.	Broncho pneumonia. Empyema, left side.
11.	March 10, 1911.	Broncho pneumonia. Pleurisy, acute, sero-fibrinous, right side.
12.	March 14, 1911.	Broncho pneumonia.
13.	March 18, 1911.	Broncho pneumonia. Multiple pulmonary abscesses. Pleurisy, acute, sero-fibrinous, left side.
14.	March 20, 1911.	Broncho pneumonia.
15.	March 30, 1911.	Broncho pneumonia. Multiple pulmonary abscesses. Pleurisy, acute, sero-fibrinous, left side. Otitis media, acute, suppurative, bilateral. Mastoiditis, acute, left.
16.	April 1, 1911.	Empyema, right side.
17.	May 23, 1911.	Acute miliary tuberculosis.
18.	November 28, 1911.	Small extra dural clot, ant. portion of l. middle fossa. "Wet" brain. Enteritis, both intestines.
19.	February 23, 1912.	Broncho pneumonia.
20.	February 29, 1912.	Broncho pneumonia.
21.	March 4, 1912.	Broncho pneumonia. Empyema, right side.
22.	March 12, 1912.	Broncho pneumonia.
23.	March 14, 1912.	Broncho pneumonia. Empyema, left side.
24.	March 19, 1912.	Broncho pneumonia. Lobar pneumonia, right lower lobe.
25.	March 21, 1912.	Broncho pneumonia. Old healed pulmonary tuberculosis.
26.	March 22, 1912.	Broncho pneumonia. Empyema, left side. Old healed pulmonary tuberculosis. Peritonitis, acute suppurative.
27.	March 28, 1912.	Broncho pneumonia. Otitis media, ac. supp. right side. Mastoiditis, acute, right side.
28.	April 6, 1912.	Otitis media, ac. supp. right side. Mastoiditis, acute, right side. Lepto meningitis, ac. secondary. Thrombosis, right lateral sinus.
29.	April 26, 1912.	Broncho pneumonia. Otitis media, ac. supp. right side. Mastoiditis, acute, right. Lepto Meningitis, ac.

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30. May 6, 1912. Broncho pneumonia.
Pulmonary gangrene.
Empyema, left side.
Abscesses, metastatic, left kidney.

Treatment.

All patients were kept in bed during the febrile stage. An adequate air-space was provided and proper ventilation maintained. After an initial purge, the medication consisted of an alkaline, antiseptic gargle, and a mixture of ammonium chloride in syrup of tolu. When the nares became occluded they were cleansed with an alkaline spray. Other treatment was symptomatic. The diet, at first liquid, was increased after the febrile stage as rapidly as could be borne. Egg noggs with brandy and whiskey were much used.

Warm Fresh Air is the most important remedial agent.

Early paracentesis in all cases of suppurative otitis undoubtedly saved many ear drums, and perhaps some cases of mastoiditis. It also hastened convalescence. The simple mastoid operation was done in the mastoid cases.

Cases with pulmonary complications were segregated, given more air space, and provided with the largest possible amount of fresh air. Rib resection with thorough drainage was performed in all cases of empyema. Aspiration was often done for diagnosis and treatment of pleuritic effusions.

In accordance with recent views on the unimportance of fomites in the spread of measles, no disinfection of barracks was attempted in this epidemic. In previous outbreaks at this post it had been done, but without success. We have been able to rid certain barracks of the disease for weeks, only to have it recur when some of the occupants inadvertently came in contact with a case in the early stages.

Whether there are true "Carriers" of measles is as yet unknown.

We did not hesitate to let the cases out of quarantine after the disappearance of catarrhal symptoms, and in no case could we trace transmission of the disease from such convalescents. We are more than ever convinced that the spread of the disease is by direct contact early in the catarrhal stage, before its recognition is possible.

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Measles was epidemic throughout Ohio last winter. I am informed that it was very severe in the eastern part of the State, and resulted in a large number of deaths.

At Columbus Barracks measles has caused a loss of 14,446 days since December, 1910, and the epidemic is still in progress. Each patient spent an average of 24 days on sick report.

With all the facts of this and other epidemics before him, one must consider measles as always a dangerous disease, and one that may, at times, be most virulent.

References.

1. "Report of an Epidemic of Measles at Columbus Barracks, Ohio, with Some Remarks on Manner of Transmission of the Disease." CAPTAIN A. C. CHRISTIE, MEDICAL CORPS, U. S. ARMY, *Military Surgeon,* Vol. No. 4, October, 1911.

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FEVERS OF UNDETERMINED CAUSATION.

By Major Eugene R. Whitmore, Medical Corps, U. S. Army.

DURING the months of July and August, 1911, I had occasion to treat several cases of typhoid fever in persons living near this reservation. Two of these cases were little girls, four years old; one was a seven-year-old boy; one was a thirteen-year-old girl; and the rest of the cases were adults. There was nothing unusual in the course of the disease in any of the cases. The Widal reaction was positive in all of the cases early in the second week. Blood culture was not made on the two little girls, but was positive in all the other cases.

During the same time, I treated four cases of malarial fever—three intermittent tertian, and one estivo-autumnal—all diagnosed by finding the parasite in the blood.

But during the same time, I treated three cases of continued fever which could not be placed under either of the above headings.

Case 1. A little boy, five years old. Never had typhoid or malarial fever and had not received typhoid prophylaxis. He had been entirely well and was out at play, until in the late afternoon he came into the house and said that he did not feel like playing any more. That night he was feverish and had a severe convulsion at about five o'clock in the morning. When I saw him, early in the morning, his temperature was 103 degrees axillary, and his pulse was 102. His skin was markedly flushed and his tongue was heavily coated, but otherwise examination was entirely negative. He had not had any chills; had not vomited; and had no diarrhoea or intestinal disturbance of any kind. He had another convulsion later that morning, but had none afterward. His temperature rose to about 103 degrees axillary every day for five days, but was quite readily reduced by an ice-bag and cool sponging. There was a tendency to constitpation, so that he was given a small dose of calomel several times. He objected to liquid diet and clamored for solid food throughout his illness. After five days his temperature remained lower, and at the end of twelve days it was normal and convalescence was rapid.

No blood culture was made, but the Widal test was made repeatedly and it was always negative. His blood was negative for malarial parasites. The leucocytes were not counted.

Case II. A soldier, 24 years old. Never had typhoid or malarial fever and had not received typhoid prophylaxis.

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He was entirely well until the morning of July 24 when he was taken sick at parade. He began to feel feverish and his bones began to ache. He did not have a chill. He was sick all of that day and came to the hospital in the evening with a temperature of 102 degrees and a pulse of 80. Examination was entirely negative, except that his skin was markedly flushed. The next day his temperature rose to 104 degrees with a pulse of 76. There was no gastro-intestinal disturbance, but there was a tendency toward constipation. His temperature rose to 104 degrees every day to include July 30th, his pulse never going above 82. Then his temperature remained lower from day to day until, on Aug. 5th, it remained normal.

Blood culture was negative for typhoid bacilli and for micrococcus melitensis on two examinations when his temperature was highest; while the Widal reaction was negative repeatedly during his illness and during convalescence. His faeces and urine were negative for typhoid bacilli during convalescence. His blood was negative for malarial parasites on several examinations. The leucocytes were not counted. The man denied venereal infection, but the Wassermann test was not made on his blood at that time; however, he has not received any anti-syphilitic treatment since that time and his blood gave a negative Wassermann reaction on March 16, 1912.

His urine was normal in amount and contained no albumin or casts at any time.

Case III. A soldier, 31 years old. Never had typhoid fever. Had malarial fever ten years ago. Typhoid prophylaxis completed in April, 1911.

The man had felt "tired" and "droopy" for about a month, but dated his actual illness to the forenoon of Aug. 2nd, when he began to have headache and fever. His headache and fever got worse and he entered the hospital at 2 P. M., Aug. 4th, with a temperature of 102 degrees and a pulse of 84.

His skin was markedly flushed, but otherwise examination was negative. His temperature rose gradually, and went to 104 degrees on Aug. 10th, and again on Aug. 11, his pulse being 96 and 90 at those times. The temperature was very irregular, even touching normal at times. His temperature was 102 degrees at 4 P. M., Aug. 16th, and beginning with Aug. 17th, it remained normal.

The man had no chills, and there was no gastro-intestinal disturbance; only slight constipation. Late in the illness his spleen was slightly enlarged.

Blood culture was negative for typhoid bacilli and micrococcus melitensis on four different examinations. The man had received typhoid prophylaxis, and therefore the Widal test was not made, except once it was reported negative from the laboratory in Washington. His faeces and urine were negative for typhoid bacilli during convalescence. His blood was negative for malarial parasites on repeated examination. The

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leucocytes were not counted. The man denied venereal infection, but the Wassermann test was not made on his blood at that time; however, he has not received any anti-syphilitic treatment since that time and his blood gave a negative Wassermann reaction on March 16, 1912.

His urine was normal in amount and contained no albumin or casts at any time.

The man never seemed very sick; constantly asked for food, and was very anxious to go to duty before the examination of the faeces and urine was completed. He lost about twenty pounds in weight but gained it back rapidly.

These cases resemble each other in several particulars: rather sudden onset; marked flushing of the skin early in the disease; absence of chills and gastro-intestinal disturbance; slight constipation; negative physical signs and blood findings; and rather irregular fever of twelve to fifteen days' duration.

Were they cases of typhoid fever?

In the case of the child, the blood and faeces were not examined culturally; however, the Widal reaction was negative, even during convalescence, and the urine was negative for typhoid bacilli.

In the other two cases, the negative blood cultures, the negative Widal—even during convalescence (in one case; in the other case the Widal could not be depended on and was made only once), and the negative findings for the faeces and urine, all speak rather strongly against typhoid fever.

Were they cases of typhus fever (Brill's disease)?

The onset was fairly sudden in all of the cases. Headache was present, but was not a prominent symptom. The eruption was erythematous in character, and was never petechial; the child was suspected of being a case of scarlatina; case III was isolated the first evening as a suspected case of measles, but this was more of a precautionary measure, as the next morning the eruption was a pure erythema with nothing of a macular character.

The eruption was present in all the cases when they were first seen, and disappeared in two or three days. The eruption was as marked on the face as on the body. There was no cough. The pulse was not high, being more of the typhoid type; and there was no prostration. All of the cases claimed to feel well, even when the fever was highest.

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In case III, the spleen was palpable late in the disease; it was not palpable in the other cases. There was a rather rapid fall of the temperature to normal at the termination of the disease.

The clinical picture is not that of typhus fever (Brill's disease).

Were they cases of malarial fever?

The negative blood findings, the absence of chills, and the absence of any considerable enlargement of the spleen, speak against malarial fever. All of the cases recovered promptly without quinine, and none of them has had any fever since that time.

The cases did not resemble dengue fever, neither did they resemble Malta fever, and the negative blood findings speak against the latter disease.

The patients are all in first class physical condition now, seven months after their illness, so tuberculosis can be ruled out.

Syphilitic fever is practically ruled out, in the two adults, by the negative Wassermann reaction.

I spoke of these cases at a meeting of the Escambia County Medical Society, and found that all the members were familiar with such cases, which were not typhoid, malaria, or dengue, and they informed me that they knew these cases as "simple continued fever" for want of a better name.

In a paper read before the Bombay Medical Congress in Feb., 1909, I stated that, while malaria, typhoid, and dengue were common in the Philippine Islands, I had met with some cases of continued fever there, which could not be placed under any of these heads.

In the report of the U. S. Army Tropical Board for the quarter ending March 21, 1911, are cited three cases of continued fever "of undetermined causation." One case was plainly a case of syphilitic fever, as determined by the Wassermann reaction, and by the results of anti-syphilitic treatment. In another case, the board was unable to say whether it was a light case of typhoid, with a quick disappearance of the agglutinins, or whether it was an infection of some other nature. In the third case, there was nothing definite on which to base a diagnosis. Blood, faeces, and urine were negative for typhoid. A dysentery bacillus of the Hiss-Russell type was isolated from one stool specimen of this

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patient, but the board states that "it is very doubtful if the organism had anything to do with his febrile movement."

Unfortunately, the Wassermann reaction was not available at the time I studied my cases in the Philippines, so it is not possible to say whether any of them was syphilitic fever.

Everyone is skeptical when a case of fever, lasting over ten days, is called "simple continued fever," and Butler says "the frequency with which the diagnosis of this fever is made is in inverse ratio to the diagnostic thoroughness and acumen of the observer." This may be so, but my cases here and in Manila were negative for typhoid and malaria by all the tests that we use today, and in my cases here, blood, faeces, and urine were all sent to the Army Laboratory in Washington, and in every instance, their report agreed with my finding here. In the same way, the cases reported by the Tropical Board in Manila were carefully and accurately worked out. As stated above, one of their cases did not show anything on which a diagnosis could be made; in one case, the board was unable to say whether it was a mild typhoid or not; while the diagnosis in the third case was cleared up by the Wassermann reaction.

I believe that it is not so uncommon to meet with cases of continued fever which cannot, with our present methods of diagnosis, be definitely diagnosed. Compared with typhoid fever as a disease, these cases are simple continued fever, and that is probably all that is meant when the term is used. Undoubtedly, it is better to speak of such cases as "fevers of undetermined causation"; and it is always necessary to treat these cases as typhoid fever.

Whether these cases of mine were mild typhoid or paratyphoid that were negative by all of our present diagnostic methods; whether they were due to auto-intoxication (especially case I); whether they were due to exposure to the sun (especially cases II and III); or whether they were due to some other cause, I cannot answer.

Case III, of my series here, is especially interesting, as the man had received typhoid prophylaxis three or four months before his attack of fever.

All of my cases were treated as typhoid fever, and I consider it very important that they be so treated, as mild cases of typhoid

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may not be diagnosed until they develop a positive Widal during convalescence, and again, it is possible that mild cases of typhoid may not be diagnosed at all.

CONCLUSION.

There are cases of continued fever of ten to fifteen days' duration which cannot be definitely diagnosed according to our present methods of diagnosis. While the Wassermann reaction has cleared up the diagnosis in some cases that formerly were not diagnosed, there still remain cases which cannot be placed.

These fevers of undetermined causation—often called simple continued fever—should be treated as typhoid fever in order to guard against possible errors in diagnosis.

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GUNSHOT FRACTURE OF BOTH BONES OF THE FOREARM. RECOVERY.

By Major GEORGE A. SKINNER, Medical Corps, U. S. Army.

PRIVATE A, Battery "E," 4th Field Artillery, while at target practice in the mountains, July 8, 1910, was accidentally hit by a misdirected shrapnel, which exploded near the marking party. One of the lead balls entered the posterior surface of the right forearm, at about the middle, passed through the forearm, fracturing both bones, and buried itself in the lower part of the arm just above the internal condyle. The bones were literally smashed, especially the ulna. The wound of exit on the anterior surface of the forearm was large and ragged. There was an abundant opportunity for infection, for the young soldier had to ride his

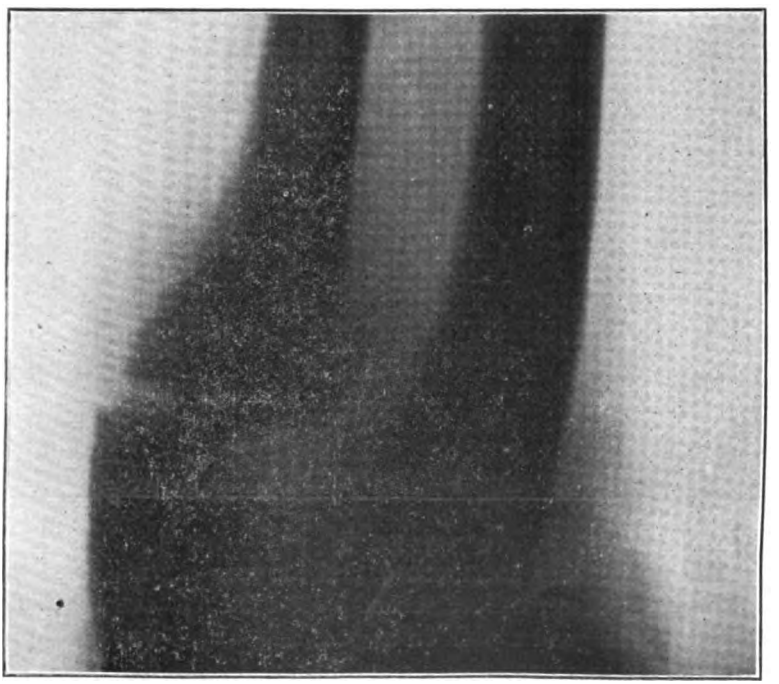

Fig. 1.

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mule three miles to camp and then was transported by ambulance 35 miles to the hospital.

When first seen by the writer, about 20 hours after the injury, his general condition was fairly good, but the arm did not offer much hope as a useful member, even if it was not necessary to amputate, which at that time appeared among the immediate possibilities.

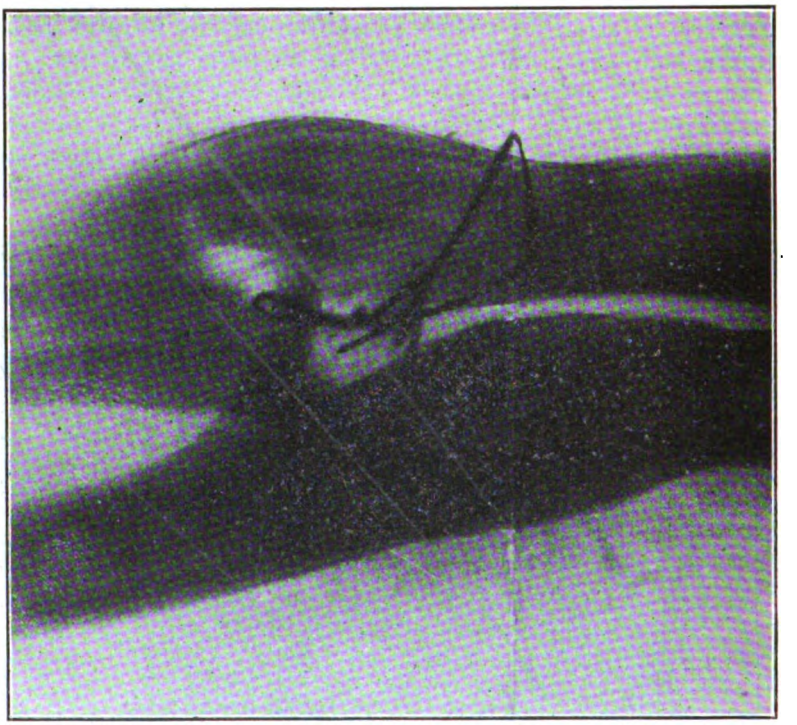

FIG. 2.

The patient was anesthetised, and the arm cleaned, the fragments that were totally detached were removed, and the bones wired into as good a position as possible. There was a little infection, but this was quickly controlled, and there was practically primary union of the soft parts, except for a small sinus. After about four weeks the X-ray showed excellent results in the radius, but the wires had slipped on the ulna, and there was no union in that bone. A few days later there appeared a small swelling on

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the posterior surface of the arm, and a fair-sized fragment of bone was removed. Function returned into the hand quite rapidly, and the soldier went to light duty four months after being hurt, though there was a sinus persisting on the posterior surface of the forearm.

Several times he returned and small fragments of bone were removed from just under the skin in the neighborhood of the sinus. The sinus closed later and he was able to do most of his work. Then the forearm became sore and a piece of necrosed bone could be felt through the sinus, which had opened again. Under local anesthesia this piece of bone was removed and the sinus again closed. About this time the command was ordered to Texas and the soldier accompanied his battery. Toward the latter part of the stay in Texas, he again came to me complaining that he could not rotate the forearm. An X-ray picture was taken and showed that there was a spur of bone that united the bones, and what also appeared to be a necrotic area surrounded by callus. His arm was painful, so I decided to operate again

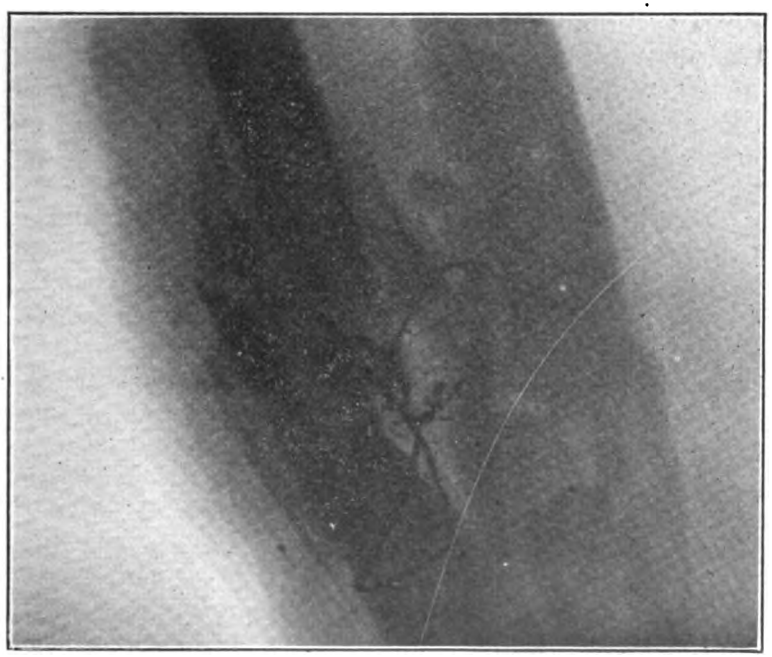

FIG. 3.

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and remove the spur and the necrotic bone. This was done under general anesthesia in the field hospital in June, 1911. The wound closed promptly and partial rotation was restored. Since the last operation last June (June, 1911), the arm has steadily improved in function, and at present writing he has excellent use of it, though there is still some limitation in rotation, and some shortening of the superficial tendon of the index finger of the right hand. Aside from these two slight impairments of function he has practically all the original strength and movements.

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THE PURIFICATION OF WATER BY MEANS OF THE DARNALL FILTER.

By Lieut.-Col. L. H. REICHELDERFER, Chief Surgeon, N. G. D. C.

THE National Guard of the District of Columbia (average strength 1,350) encamped about two and one half miles northwest of Frederick, Maryland, from Aug. 18 to Aug. 27, 1911, on ground occupied a few weeks previous by troops of the Maryland National Guard.

A main, carrying water from the source of supply several miles away in the high country, to the northwest of Frederick, crossed the camp site and was tapped to furnish all water used by both encampments.

The Medical Department of the Maryland National Guard submitted samples to the State Laboratory for analysis; the report showed dangerous contamination, and it was decided to boil all water used for drinking purposes. Prior to the District of Columbia encampment, samples were submitted to the laboratory of the Army Medical School at Washington; the report on these made by Major Russell, of the Medical Department, U. S. A., showed colon contamination to such a degree as to render the use of the raw water most inadvisable. It is interesting to note that an analysis made of a sample taken in Frederick was much better than in a sample taken at the camp site; the improvement being due no doubt to the presence of a fairly large storage reservoir between the camp and the city.

After some consideration, it was decided to erect a battery of six Darnall filters to be located at a central point of the camp site, so as to minimize, as much as possible, the distance of transporting the treated water. (In no case was this over 300 yards.)

Major Darnall, of the Army, who devised this filter, kindly gave most valuable suggestions as to the erection and the working of the plant. The construction was done by a local contractor from sketches furnished by the Chief Surgeon; the details may be more readily understood from the accompanying photographs.

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FIG. 1.

On the upper step of the scaffolding were placed 12 whisky barrels, with movable covers and having two threaded water spigots, one at the bottom and one six inches higher. A supply pipe was run from the water main to the scaffold; a length of hose served to supply each barrel; after filling with the raw water, a proper quantity of the hydroxide powder was stirred in; the water was then allowed to settle until needed. After settling, the treated water above the six inch level was drawn

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off through a hose attached to the upper spigot and run through the filter on the shelf below; from the filter a rubber tube carried the water to the lower row of storage barrels. The water in the bottom of the upper barrels, containing the greater part of the impurities thrown down by the alum powder, was drained by a hose to a neighboring rock pit; the barrels were rinsed and the process repeated. A wash boiler on a "spider" over a small fire, near by, furnished an easy and thorough method of sterilizing the filter cloths.

The practical working of this plant was most satisfactory. There was nothing unpleasant about the water; for a few days there was a faint (distressingly faint) odor and taste of whisky, but after that the water was tasteless. The detail was secured from the War Department, of an enlisted man of the Hospital Corps of the Army, who was familiar with the use of the filter; under him was placed a permanent detail of four enlisted men, the whole being supervised by a medical officer. This detail was ample; as a matter of fact the plant would have furnished drinking water for 3,500 or 4,000 men without difficulty. The cost of the scaffold, barrels, spigots, hose, etc., was $106.

It is believed better results can be obtained from a single central plant, with a permanent detail in charge, than by scattering the filters among the organizations,—at least in the National Guard.

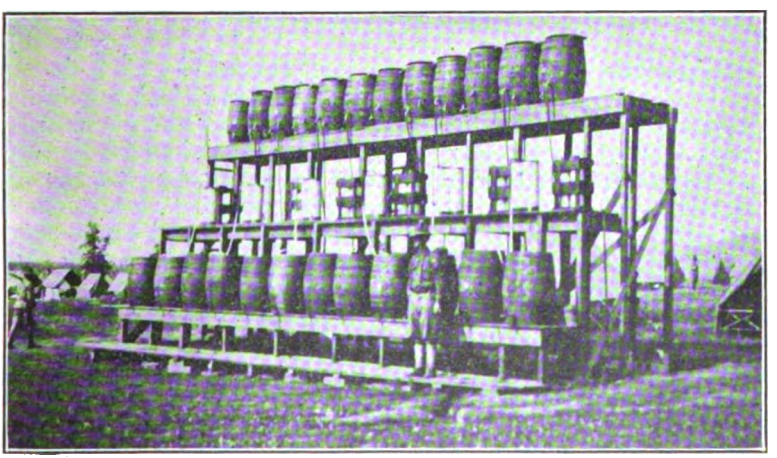

FIG. 2.

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We were fortunate in having our raw water under pressure sufficient to reach the upper barrels; but under ordinary conditions of supply a hand or gasoline pump could be utilized.

No cases of typhoid developed during or after camp; cases of gastro-intestinal disturbance were no more numerous than usual.

Considering our needs and the circumstances of the local supply, it is believed that the method described gave results as satisfactory as any that could have been used.

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A SIMPLE MARKER SET FOR THE SOLUTION OF MEDICAL FIELD PROBLEMS.

By Major M. A. W. Shockley, Medical Corps, U. S. Army.

THE use of a set of markers in the solution of field problems assists much in this work—it gives the positions of the fighting force and the sanitary organizations, assists map reading and the estimation of distance, position and time; and, if markers are made to scale and marked as to road distance and front of organization, materially aids in learning same.

The set described below can be made without difficulty from materials at hand.

In making the markers in this set the conventional signs used in "Medical Service in Campaign"—Straub, have been followed.

CONTENTS OF SET.

One box for pins and markers. A wooden microscopic slide box with cover—grooves to contain 25 slides. For partitions insert glass slips in grooves 12-16-19-22, fasten in place with sealing wax or glue.

Space 1-12.—Contains markers of Cavalry, Infantry, Artillery, etc.

Space 13-16.—Contains red pins and Regimental Aid Station markers.

Space 17-19.—Contains Dressing Stations, collecting station for slightly wounded and Reserve Medical Supply Markers.

Space 20-22.—Contains Ambulance Company and Field Hospital markers.

Space 23-25.—Contains lines of communications and base organizations, and blue pins.

Scales.—Apply two (1″ wide) strips of rubber adhesive plaster to top of box cover, selvedge edge on long edge of cover. Take off the 2″=1 mile and 4″=1 mile scales from some good map on the cloth back of rubber adhesive plaster strips on box cover in pencil—trace in ink—also making walking scale, mixed troops, 80 yards to one minute and trotting scale 220 yards to one minute.

Pins.—Procure red and blue glass topped dressing pins at least 3.5 cm. long to the number of 50 each.

Markers.—Procure red, blue and yellow cardboard about the thickness of an ordinary calling card, or dye blank calling cards with Füchsin, Methylene blue and orange G.—aqueous solution, dry and cut as directed.

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Regimental Aid Stations.—Punch discs 3-16 in. circumference out of appropriate colored cards blue, yellow and red, with leather punch.

Dressing Stations.—Cut squares slightly larger than discs out of white card—number 1 to 4 on both sides with red ink.

Ambulance Companies.—Cut narrow oblongs from white card, length to scale road distance 4″ to 1 mile—number 1 to 4 red ink one side, black ink other side—red ink represents dressing and litter sections present—black ink absent.

Collecting Station for Slightly Wounded.—Cut small square from red card. (Size of dressing station.)

Field Hospital.—Cut narrow oblongs from white card, length to scale road distance 4″=1 mile—number 1 to 4—red ink on one side, black ink other side—red ink denotes presence personnel—black absence—red ink cross at end on each side.

Reserve Medical Supply.—Cut small squares (size of dressing station) from white card—color one-half red on diagonal.

Transport Column.—Cut narrow oblongs from white card to scale, road distance 4″=1 mile—mark both sides with red cross.

Rest Station.—Red triangle (size of dressing station).

Evacuation Hospital.—White lozenge, 7-16″x3-16″, red cross—number 1 and 2 both sides, black ink.

Hospital Train.—Red narrow oblong. White transverse stripes (making 4 squares, each size of dressing station).

Base Medical Supply Depot.—Large white square—color one-half red on diagonal, 5-16″.

Base Hospital.—Large white square—mark with red cross, both sides, 5-16″.

Hospital Ship.—Red ship—flattened ellipse, 9-16″ long.

Line Organizations Road Distance.—Battalions and regiments, cut narrow oblong to road distance, scale 4″=1 mile—appropriate color.

Line Organizations, Extended Order.—Companies, troops and batteries and battalions to scale of front 4″ to 1 mile.

Mark in black ink road distance and front of organizations on large markers.

Use: Pick up proper marker (proper color of arm) on pin of color of force engaged and apply to position on map—take care not to obscure numbers or letters on map by covering.

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ANTS DESTROYING LARVAE OF FLIES.

By First Lieutenant GEORGE P. STALLMAN, Medical Reserve Corps, U. S. A.

IN connection with the article written by Captain Percy L. Jones in the July issue of the Military Surgeon for the year 1910 entitled "The Ant as a Destroyer of Flies," in which it is stated that Mr. Banks, of the Philippines Bureau of Science, told the author that he did not know of any ant in the United States of the same species as the one found in the Philippine Islands which destroys the eggs and larvae of flies, the writer wishes to call attention to the common outdoor ant of southern Arizona.

From March 23 until April 21, 1911, the writer was stationed at Alamo Hueco, forty miles south of Hachita, New Mexico, with a troop of the 4th Cavalry. The weather was very warm, with no precipitation, and flies were exceedingly numerous. The latter part of April, the writer was transferred to Nogales, Arizona, on duty with a squadron of the 6th Cavalry. Similar conditions as to dryness of climate were found in Nogales as had prevailed in camp at Alamo Hueco, and the writer was immediately struck by the absence of the large number of flies usually found in a cavalry camp. Conditions seemed auspicious for their propagation and with thoughts of Captain Jones' article in mind, the writer sought for the cause of their absence. One day while making the usual inspection of the rears, he noted white objects apparently crawling up the side of the pit of the officers' rear, which was an open pit about six feet long, three feet wide, and several feet deep. One end of the pit was so exposed as to be used for urinating and with the large number of officers using it, the soil at the bottom was kept saturated. Upon inspecting the white objects closely, they were found to be living larvae of the fly in the grasp of the common red ant, which were very numerous about the camp. The larvae squirmed about in endeavor to escape, but were carried off to the adjoining ant hill.

The above was noted during the dry season, when the dryness was so great that the flies had but few moist places to deposit

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their eggs. Beginning with the latter part of June, rain fell almost daily, affording so many places for the larvae to live that the flies became almost unbearable about the kitchen and mess tents. The ants were not sufficient in number to keep down the number of flies.

An interesting thing about these ants was exhibited by putting a large centipede close to an ant hill, when the ants would swarm over it in vast numbers and soon put it to death by injecting their poison between the shells at the joints.

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CURRENT LITERATURE

Titles marked with an asterisk (*) are abstracted below.

BELGIUM.

Archives Médicales, Belges.

May, 1912.

1 The Diagnosis of Pancreatitis. M. Van den Broeck.

June, 1912.

2 Note on Anesthesia with Novococaine. M. Walch.
3 Abdominal Massage. M. de Marneffe.

CHARLES F. CRAIG.

FRANCE.

Archives de Médecine et de Pharmacie Militaires.

July, 1912.

4 Address on the Presentation of a Commemorative Medal to Dr. J. Lucas. Championniere. Delorme.
5 Acute Insufficiency of the Adrenal in the Course of Epidemic Infectious Diseases. Chauliac.
6 Concerning the Use of Camphorated Oil in Abdominal Surgery. Lahaussois.
7 Parasitic Affection of the Arm. Gruet.
8 Enormous Hypertrophy of the Heart of Unknown Origin. Farganel.
9 The Medical Examination and the Identification of Volunteers for the Foreign Legion. Rouffiandis.
10 Ocular Affections in Southern Tunis. Lefevre.

H. J. NICHOLS.

Archives de Médecine et Pharmacie Navales.

June, 1912.

11 Cruise in the Atlantic. Extract from Report of the General Inspection. Dr. Valence.
12 Tuberculosis at the Arsenal of Brest. Dr. Bourges.
13 *Treatment of Seasickness by Veronal. Dr. Conlombe.
14 Aeration and Ventilation of the Kleben. Dr. Duranton.

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13. **Veronal in "Mal de Mer."**—There seems from the reports received from medical officers of Trans-Atlantic lines and of the French Navy, that veronal is really of service in seasickness, either as a prophylactic or taken during an attack. M. D. Conlombe, writing on this subject, concludes that "Veronal, pure, or with soda (Veronal sodique, Merck), as a rule prevents the onset of seasickness and in developed cases gives noted amelioration of the most important symptoms. Dr. Conlombe states that while veronal is not a specific it is preferable to all other medicines by its certain and rapid influence. The best results are had when veronal is taken as a preventative half an hour before sailing in doses of fifty centigrams, or one gram in strong subjects, given in hot tea. If the dose is vomited it should be repeated. The "Veronal sodique" is preferable on account of its solubility and hence more rapid absorption.

JOHN C. WISE.

Bulletin de L'Académie de Médicine.

May 21, 1912.

No articles published in this number.

May 28, 1912.

No articles published in this number.

June 4, 1912.

15 The Modification of Intra-Occular Tension by Surgical Methods. Felix Lagrange.

June 18, 1912.

16 Recent Results of Carrell in the Cultivation of Tissues. M. Pozzi.

June 25, 1912.

17 Report of Committee on New Hospital at Lyon.
18 The Blue Malady. Ed. Boinet.

July 2, 1912.

19 The Relation of Wine and Cider to Gout. M. Motais.

July 9, 1912.

20 Report on Mineral Waters.
21 Report on Construction of New Hospital at Lyon.

CHARLES F. CRAIG.

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GERMANY.

Deutsche Militärärztliche Zeitschrift.

June 20, 1912.

22 Field Medical Pouch in Field Glass Form. George Schmidt.
23 Some Hints for Medico-Military Examination of Defects of Vision. G. Pfalz.
24 Concerning Egyptian Sanitary Regulations. Adam.
25 A Case of Hysteria Without Apparent Cause. Broese.
26 A Fatal Case of Hemorrhagic Diathesis in a Man in His Second Year of Service. Vollmer.

July 5, 1912.

27 On the Symptoms and Treatment of Basedow's Disease. Fritz Schulze.
28 Concerning the Release of the Hysterical Condition by Heat Trauma. P. Eckert.
29 Articles on Appendicitis and Related Subjects in 1910 and 1911. Zur Verth.

July 20, 1912.

30 Alcoholism, Its Dangers and Prevention. Wirth.
31 Rupture of a Duodenal Ulcer into the Peritoneal Cavity Cured by Operation. Doebbelin.
32 A Case of Tendon Sarcoma of the Right Leg. Mohr.
33 Note on the Treatment of Scabies with Sulphur Ointment. F. Winter.

H. J. NICHOLS.

GREAT BRITAIN.

Journal of the Royal Army Medical Corps.

July, 1912.

34 Antelope Infected with Trypanosoma Gambiense. Captain A. D. Fraser, R. A. M. C., and Dr. H. L. Duke.
35 Our Aryan Brother. Colonel R. H. Firth, R. A. M. C.
36 The Papataci Flies (Phlebotomus) of the Maltese Islands. R. Newstead, M. Sc., A. L. S., etc.
37 The Anatomy and Life-History of Anchylostoma Duodenale (Dubini). Professor A. Looss, Ph. D., Abstract by Major S. L. Cummins, R. A. M. C.
38 Note for Guidance in the Writing of Medical Appreciations. Colonel T. P. Woodhouse.
39 *Boots. Colonel C. H. Melville, R. A. M. C.
40 *The Structure and Functions of the Foot. A. H. Tubby, M. S. Lond., F. R. C. S. Eng., Major R. A. M. C. (T. F.).

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39. **Boots.**—The author states that the first point to be considered is the sole, and this may be looked at from the side in respect of its thickness, and from below in respect of its shape. He says that as a matter of fact, it is impossible to dissociate these two points of view, since the shape is affected to an important extent by the thickness. The object of the sole is to protect the foot against injury from contact with the ground. In a thin-soled boot, or in a sandal, the "push" of the foot is communicated mainly along the big toe, but as the sole thickens the impulse is communicated much more by the whole breadth of the foot at the metatarso-phalangeal junction; the extent to which this is done varies very much in different people. He states that the important part of the sole as regards shape is the breadth at the metatarso-phalangeal joint, and here accurate fitting is most important. In front of this, so long as the toes are not crowded, actual shape is comparatively immaterial. The toe which of all suffers most from crowding is the big toe, and therefore in front of the broad part of the sole the inside border should run straight forward for a distance sufficient to accommodate the whole length of the big toe.

The author thinks that a good deal of extravagant writing about footgear has resulted from people forgetting that the shod man walks in an entirely different manner from the unshod man, and that the person we have to provide boots for is a lad who for eighteen to nineteen years has been wearing cheap, badly made boots, whose foot to all intents and purposes ends at his metatarso-phalangeal joint line. The author then discusses the military shoes or boots of the various nations, pointing out their good and bad qualities.

40. **The Structure and Functions of the Foot.**—The author states that it is clear that in both the normal and flat foot adduction is always accompanied by inversion and the longitudinal arch rises; whilst abduction is associated with sinking of the arch and eversion. Any cause such as faulty standing, bad walking, and boots which interfere with normal movements cause flat foot and all its attendant evils. There is, however, another important fact to be grasped. In the "strong" walk of a healthy individual or of

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the savage, the great toe is seen to be adducted when the foot is placed upon the ground. Thereby the great toe supports the anterior pillar of the internal arch and prevents the foot rolling over, as it were, on its inner side.

The faults usually found in boots are:

(a) They are too narrow across the toes and the front part of the foot is cramped, so that its physiological movements are suppressed and the great toe is squeezed laterally outwards; and it is unable to carry out the physiological movement of adduction so essential to the maintenance of the internal longitudinal arch. Boots too small cause blisters, corns, and bunions.

(b) The heels are too high and the toes are driven forward into too narrow a space and they are cramped; too much weight falls on the heads of the metatarsal bones, the anterior metatarsal arch is depressed and corns form beneath the heads of the metatarsal bones.

(c) The support in the waist of the boot is sufficient, and the result is that the arch of the cramped foot already beginning to sink is left unsupported and drops further.

(d) The soles of the boot are too thin and a "rocker" action from side to side and from front to back is established. Owing to the former the anterior metatarsal arch sinks into the concavity and becomes permanently convex. Hence the onset of Morton's disease of metatarsalgia. Owing to the "rocker" action from before backwards the toes are no longer capable of complete flexion and become contracted, in fact they are permanently extended, the front part of the foot being extended becomes abducted.

(e) The depth of the upper of the boot over the great toe is too little and therefore this digit has no freedom. It cannot be flexed when the foot is lifted from the ground and the toe cannot be brought straight to the front as its under part has no free action in the boot; the toe becomes permanently dorsiflexed and abducted and a bunion forms.

(f) Boots are often too short. This gives rise to a combination of every ill result.

(g) The inner border of the sole of the boot is convex instead of straight or slightly concave. This is totally wrong because

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the front part of the foot is abducted and held so permanently. Further, all possibility of assuming the position of adduction, or the position of strength, when the foot is raised off the ground, so essential to its activity is lost. Boots must be so shaped as to assist adduction and prevent abduction of the foot.

ALBERT G. LOVE.

Public Health.

July, 1912.

41 The Housing Regulations, 1910, and Discussion. J. A. Gibson.
42 The Position of Assistant Medical Officers of Health. A. Harris.
43 On the Work of the Portsmouth Tuberculin Dispensary. J. Fairley.
44 The Administration of the Sanitorium Benefit Under the National Insurance Act, 1911. Edward Sergeant.
45 The Present Position of Eugenics. F. G. Bushnell.

CHARLES F. CRAIG.

RUSSIA.

Morskoj Wrach.

January, 1912.

46 Institute for the Study of Infectious Diseases in Tokio. P. S. Gomzjakow.
47 *Statistics Concerning the Wine Ration Issued on Naval Vessels. E. Yablonski.
48 *Naval Surgeons in Austro-Hungary. S. S. Trjemeski.
49 Report of the Pathologic Department of the Kronstadt Naval Hospital for 1909. A. D. Woloshin.

47. **Wine Ration Issued on Naval Vessels.**—Wine rations are still issued the Russian jackies serving on men-of-war. Yablonski reviews the problem of wine drinking theoretically and shows that a large percentage of the marines voluntarily refuse to avail themselves of the ration. The author maintains, and tries to substantiate his claims by a series of ingeniously prepared statistical tables, that the habitual use of wine even in moderate quantities has a deleterious effect on the health and that the time is ripe to do away with the issue of alcoholic drinks.

48. **Naval Surgeons in Austro-Hungary.**—Trjemeski reviews some features pertaining to the medical corps of the Austrian Navy. Austrian citizens having an Austrian medical degree may enter the medical service of the navy if single and not older than thirty-two years and in possession of papers showing that

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they have served their one-year military service. Candidates must also obtain certificates of fitness from some naval staff surgeon. All papers are sent directly to the War Department—Austria has no independent naval department—by the candidate. If accepted as an acting frigate-physician (lowest medico-naval rank) the candidate serves six months afloat and six months in a naval hospital where he also attends special lectures. After a thorough examination in naval hygiene, tropical medicine, military surgery and naval law and customs, etc., he is commissioned frigate-physician, assimilating frigate lieutenant. There are but 82 medical officers in the navy. The surgeon general ranks as rear admiral, 2 as "captains of ships," 4 as captains of frigates, 9 as corvette-captain, 46 as line-ship lieutenants and 20 frigate-lieutenants, a nomenclature, which, of course, differs from our corps. The salary is ample. Naval medical officers have full military status and disciplinary powers. In the navy the fleet officers rank first, naval lawyers next, naval surgeons third, naval engineers fourth and naval administrators fifth; that is to say, as corps. The duties, emoluments, pensions, etc., do not differ much from ours, except that 40 years service is needed to insure full pension.

Wojenno Medicinskij Journal.

January, 1912.

50 *A Year in the Surgical Department of the Obuchow City Hospital for Men. S. P. Grawirowski.

51 A Case of Stomach Wound. Th. S. Migai.

52 *The Treatment of Tuberculosis of the Lungs by an Ether-Petroleum Mixture. W. Th. Snitowski.

53 Another Case of Desertion Under the Influence of Psychic Affect. T. D. Thaddejew.

54 Antiformin for the Determination of Koch's Bacilli in the Sputum. A. R. Elsberg.

55 Sanitary Institutions of the Saxonian Military Camp near Koenigsbrueck. K. W. Karaffa-Korbutt.

56 *Organization of First Aid to the Wounded on the Battlefield. S. A. Shanjawski.

57 The Problem of Rejection of Recruits. S. P. Troitski.

58 The Ambulatory and Hospital Treatment of Venereal Diseases in the German Army. K. S. Zamurawkin.

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50. **A Year of Hospital Surgery.**—The author, like many other medical officers in the Russian and German armies, has been detached from his regiment for practical work in a large civil hospital. American army surgeons will be interested to learn of what value such detached service can be to an ambitious young officer. Grawirowski reports that during his stay in the hospital he acted as operator, assistant or anesthetizer in 470 operations, including 20 cases of spinal anesthesia, produced by him. He operated for wounds of the heart (1), spleen (1 after Frey), diaphragm (2), stomach (perforating) (2 laparotomy), skull (fracture, debridement 3), nerve (neurorrhaphy 1), tendon (suture 4), trachea (cut-throat, tracheotomy 2), lungs and pleura (3). Among other operations I quote: Gastro-enterostomy (2), gastrostomy (4), jejunostomy (2), volvulus (2), appendectomy (14), incarcerated inguinal hernia (6), umbilical hernia (1) hernia, fem. incarc. (1), ordinary inguinal hernia (24) and once a hernia in the linea alba, 5 times he operated for prolapse of the rectum according to Rehn-Delorme, twice for fistula-in-ano, 8 times for hemorrhoids and rectotomy for Douglas abscess (2). The genito-urinary apparatus is represented by external urethrotomy (1), hydrocele (4), funiculocele (2), varicocele (1), phimosis (1). Six times he opened the mastoid cells and 4 times trephined radically. He cites one plastic operation of the nose and eventration of the orbit for carcinoma (1). He performed rib resection and pleurotomy 12 times, ligated the brachial and external carotid arteries, made 11 amputations (major) and 10 osteotomies. He reduced the humerus 7 times and once the femur. Four times he trachectomized for acute poisoning, made 3 Thiersch transplantations and extracted two foreign bodies. The complete list embraces 217 operations in 207 seances. Grawirowski discusses in a thorough manner the technical steps adopted by the chief of the department with the pathology and diagnosis of the more interesting cases. This, of course, cannot be abstracted. Suffice it to say that the young surgeon proves that his stay in the clinic has favorably influenced his own surgical judgment and that he has familiarized himself with problems of indications for operative therapy and with the rationale of certain technical modifications. It would appear that an arrangement

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with large private hospitals, in which young medical officers of the U. S. Army should be given an opportunity to do certain practical work under the guidance of acknowledged leaders in medical thought would prove advantageous, in view of the limited material at their disposal in small garrison hospitals.

52. **The Treatment of Pulmonary Tuberculosis with Petroleum-Ether Mixture.**—Snitowski regrets that since the report in 1907 by Dr. Wrinkow on the favorable influence of a mixture consisting of petroleum 6.0, sulphuric ether 15.0, sterilized castor oil 95.0 and menthol 0.4 administered as an inhalant, on the local and general phenomena of pulmonary tuberculosis, not a physician has published anything on the subject. He did not like the preparation, however, for it proved too irritating and instead resorted to one prepared by the American firm, Parke, Davis and Company (Glaseptic). He allows a few deep inhalations 4-6 times daily. In 5 cases treated, all of whom were advanced, he observed decided improvement, in fact, so much so that he objects to the administration of tuberculin, creosote, ichthyol, iodoform, etc.

56. **Organization of First Aid on the Battlefield.**—Shanjawski, who is senior brigade surgeon of the Caucasian Artillery, contributes a complete review on the problem of first aid at the front, based on the Russo-Japanese war and on its recent literature. The article is too important to be abstracted in this department. An extensive translation may appear—depending on the decision of the editor—in an early issue of THE MILITARY SURGEON under Reprints and Translations.

February, 1912.

59 *Bone Suture in Simple Fracture. L. S. Dobrowolski.
60 A Few Words on Suturing in Injuries of Large Bloodvessels. N. A. Thedorow.
61 Comment on Dr. Nijibitzki's Article: "Simplification in Roentgenography." W. Th. Ewdokimow.
62 Clinical Work in London and Edinburgh. M. S. Astwatsaturow.
63 Lymphadenitis and Lymphadenitics. N. P. Grawirowski.
64 The Problem of Salting Meat. S. W. Ljubomudrow.
65 Two Years of Activity in the Hygienic Laboratory of the Khabarovsk Hospital (1909-1911). W. A. Uglow.
66 A Case of Multiple Fibromata of the Naso-Pharynx. K. B. Steinman.

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67 The Sero-Diagnosis of Syphilis According to Weichardt. W. W. Sembiratow.

59. **Bone Suture in Simple Fracture.**—Dobrowolski properly emphasizes the great value of bone-suture in the treatment of simple fractures to military surgeons. He regrets that in Russia the great problem, which has been discussed pro and con in foreign literature and surgical congresses, especially in England, has found little if any interest. The author has always received the sympathy of injured soldiers by pointing out to them that under the old routine of fixation and massage he cannot guarantee a perfect cure while with the open method of suturing a correctly healed extremity is the rule. As the means of earning a livelihood by physical labor depends on strong and normal extremities, the soldiers willingly consented to operation. Dobrowolski has very little fear of infection under aseptic precautions, but protests against even so minor an operation as subcutaneous tenotomy of the Achilles-tendon for fracture of the ankle bones, as it often produces atrophy and poor function of the concerned muscles. Dobrowlski reports two cases: (1) Fracture of the clavicle (left) at the junction of the middle and external third. The external fragment is well pushed backwards. Reduction impossible. Two days later under general anesthesia incision along the clavicle. The fracture is oblique with displacement amounting to 1½ cm. Holes were bored horizontally after the periosteum was pushed aside and the two fragments wired. Drainage by a piece of gauze, periosteal and skin sutures. Drain removed on the third day. Healing per primam. About three weeks later incision of the scar under local anesthesia, removal of wire. Slight inflammation of wound for which reason sutures are removed on the third day and wound drained. Recovery. (2) Fracture of the olecranon. Separation of fragment up to 2 cm. Function of triceps lost. Technique similar as in case 1. Suture of triceps tendon, plaster-of-Paris cast. Sutures (external) removed on 3rd day because of subcutaneous suppuration. Drainage, 17 days later removal of wire. Cylindrical callus at fracture. Recovery both anatomical and functional. (3) Oblique fracture of middle third of tibia and fibula. Suture of tibia only. Fixation. Complete recovery.

G. M. Blech.

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SPAIN.

Revista de Sanidad Militar.

July 1, 1912.

68 An Observation on Fibrinous Rhinitis. Dr. A. Ramirez Santaló.

69 Localization of Foreign Bodies (Continuation). Localizacion de los Cuerpos Extraños en Organismo Humano). Bartolomé Navarro Canovas.

July 15, 1912.

70 Salvarsan in Ocular Affections. A. Morales.

71 Mobile Pharmacies. Rafael Roldań.

A. C. CHRISTIE.

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REVIEWS

SURGICAL AFTER-TREATMENT. By L. R. G. Crandon, M. D., Assistant in Surgery at Harvard Medical School, and Albert Ehrenfried, M. D., Assistant in Anatomy at Harvard Medical School. Second edition, practically rewritten. Octavo of 831 pages, with 264 original illustrations. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, $6.00 net; Half Morocco, $7.50 net.

This work now appears in its second edition. The first edition was published as lately as 1910 and the book was reprinted in 1911, excellent testimony to the fact that it has met with a cordial reception from the profession. The volume has been largely recast with chapters entirely rewritten and others nearly so. New and better illustrations appear. As stated in a review of a previous edition the book presents in attractive form material which is of value to every one who is interested in surgery.

SEXUAL IMPOTENCE. By Victor G. Vecki, M. D., Consulting Genito-Urinary Surgeon to the Mount Zion Hospital, San Francisco. Fourth edition, enlarged. 12mo of 394 pages. Philadelphia and London: W. B. Saunders Company, 1912. Cloth, $2.25 net

The fourth edition of this well-known work is now presented for review. The contents include chapters on anatomy, physiology of the sexual act, etiology of impotence, forms of impotence, diagnosis, prognosis, prophylaxis, treatment and special therapeutics. The author has never been inclined to accept the opinions of others without proving them true to his own satisfaction, and while he has made an exhaustive study of the literature of his subject, yet this book may be rightly regarded as an expression of his personal opinions.

MATERIA MEDICA AND THERAPEUTICS, INCLUDING PHARMACY AND PHARMACOLOGY. By Reynold Webb Wilcox, M. A., M. D., LL. D., Professor of Medicine (Retired) at the New York Post-Graduate Medical School and Hospital; Consulting Physician to St. Mark's and to the Nassau Hospitals; President of the Medical Association of the

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Greater City of New York; President of the Society of Medical Jurisprudence; Ex-President of the American Therapeutic Society and of the Harvard Medical Society; Fellow of the American Academy of Medicine; Honorary Member of the Connecticut State Medical Society; Formerly Vice-Chairman of the Revision Committee of the United States Pharmacopoeia, etc. Eighth edition, Revised with Index of Symptoms and Diseases. Octavo of 832 pages. Philadelphia: P. Blakiston's Son & Co., 1912. Price, $3.00 net.

In the present revision of this work it has been divided into two parts; the first being devoted to materia medica and pharmacy, after which the description of remedies is taken up in detail. An exhaustive index is furnished, and in order to avoid repetition cross references to pages have been inserted. The book is comprehensive in scope, while at the same time condensation has been practiced as far as is compatible with clearness.

A TEXT-BOOK OF HUMAN PHYSIOLOGY—INCLUDING A SECTION ON PHYSIOLOGIC APPARATUS. By Albert P. Brubaker, A. M., M. D., Professor of Physiology and Medical Jurisprudence in the Jefferson Medical College; Formerly Professor of Physiology in the Pennsylvania College of Dental Surgery; Lecturer on Physiology and Hygiene in the Drexel Institute of Art, Science and Industry. Fourth Edition. Revised and Enlarged with 1 Colored Plate and 377 Illustrations. Octavo of 736 pages. Philadelphia: P. Blakiston's Son & Co., 1912. Price, $3.00.

This is recognized as a standard work on physiology both for students and practitioners of medicine. The author has carefully selected such facts as will not only make clear the normal functions of the tissues and organs of the body, but will also assist in understanding their abnormal manifestations as they present themselves at the bedside. Descriptions of physiologic apparatus and the methods of investigations other than those having a clinical interest have been largely excluded from the body of the book as the author believes that such information should be derived from books specially devoted to the subject and from practical laboratory teaching. In an appendix, for those who have not had laboratory advantages, will be found a brief account of the more important forms of apparatus and a description of the purposes for which they are intended.

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THE PITUITARY BODY AND ITS DISORDERS. Clinical States Produced by Disorders of the Hypophysis Cerebri. By Harvey Cushing, M. D., Associate Professor of Surgery the Johns Hopkins University, Professor of Surgery (Elect) Harvard University. Octavo of 341 pages, 319 illustations. Philadelphia and London: J. B. Lippincott Company. Price, $4.00.

To those acquainted with the work of this author it is unnecessary to say that the record of any investigation on his part is well worthy of study. The present work represents clinical studies made on over forty patients with hypophyseal diseases. The author states in his original lecture, which has been used as the basis for this book, he merely regarded himself as the spokesman for a number of co-workers at Johns Hopkins Hospital and Hunterian Laboratory. The importance of the subject may perhaps be better appreciated from a statement of the author in the preface where he says that there is every reason to believe that cases of clinically recognizable pituitary disease are at least as common as cases of clinically recognizable thyroid disease.

The publishers are to be congratulated on the appearance of the book, the presswork is very good, and the illustrations are excellent.

ORAL SURGERY. A Text-Book on General Surgery and Medicine as Applied to Dentistry. By Stewart Leroy McCurdy, Professor of Anatomy and Oral Surgery, School of Dentistry, University of Pittsburgh; Chairman of Section on Stomatology, American Medical Association (1910, 1911, 1912); Orthopedic Surgeon, Presbyterian and Columbia Hospitals, etc., Pittsburgh. Author of "Manual of Orthopedic Surgery," "Anatomy in Abstract," "Emergencies in Abstract," "Arthrosteopedic Surgery." With Two Hundred and Twenty-Eight Illustrations. Octavo of 469 pages. New York and London: D. Appleton & Company, 1912.

This volume is the first of a series of text-books which have been planned by the Commission on Text-Books of the Institute of Dental Pedagogics. It is announced that it is intended the entire subject of dentistry as it should be presented at a standard dental college be covered in these books. In the present volume bacteriology and inflammation are first considered briefly in order to introduce the subject proper of the book. The early chapters

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are rather primary and yet it is noted that the author's statements are sometimes not quite in accordance with the usual teaching. Sometimes, moreover, he advocates treatment for conditions which are wholly outside the province of the dentist unless he is also a physician. A few chapters follow on first aid to the injured which would appear to have no proper place in a book of this character.

The body of the book is made up of a number of chapters on oral surgery and these, as might be expected, constitute its chief value.

The book is concluded by an appendix which contains numerous questions on the subject matter.

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THE BALTIMORE MEETING

PRELIMINARY PROGRAM OF THE TWENTY-FIRST ANNUAL MEETING OF THE ASSOCIATION OF MILITARY SURGEONS, TO BE HELD IN BALTIMORE, MARYLAND, OCTOBER 1-4, 1912.

GOOD progress has been made in respect to the next meeting of the Association which, as has been previously announced, will be held in Baltimore, Maryland, from October 1 to 4, 1912. This will be the twenty-first annual meeting, so the Association may finally be said to have reached man's estate and it is a pleasure to be able to record the fact that on this important anniversary it is stronger in many important respects than ever before.

Baltimore, as all the members of our association know, has a medical profession which rejoices in many men of world-wide reputation. We are fortunate in having a number of these gentlemen on our committee of arrangements for the meeting in that city. This committee will be constituted as follows:

Chairman: Captain J. Harry Ullrich, N. G. Md. Colonel Charles A. Little, Colonel Louis M. Rawlins, Colonel Harry C. Jones, Colonel Robert W. Johnson, Colonel J. M. T. Finney, Dr. Hugh Young, Dr. A. C. Harrison, Dr. Marshall L. Price, Dr. Joseph C. Bloodgood, Dr. Charles O'Donovan, Dr. A. D. McConachia, Dr. John G. Hemmeter, Major Robert P. Bay, Major Guy Townsend, Captain Paul Burnett, Dr. Arthur W. Shipley, Dr. W. S. Gardner, Dr. John D. Blake, Dr. Thomas Richardson, Dr. Charles G. Hill, Dr. Emil Novak, Dr. Thad. Clark, Dr. Henry W. Kennard.

The Belvedere Hotel has been selected as the headquarters of the Association while in Baltimore.

It is believed that an important feature of the Baltimore Meeting will be the number of foreign delegates present. Many such delegates will be in attendance at the Congress of Hygiene and

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Demography which will assemble in Washington, D. C., in September of this year. The opportunity to attend two important meetings set near together in point of time will unquestionably result in a larger foreign representation than either could have hoped to secure alone. Notification has already been received that the following foreign delegates will be in Baltimore:

Canada.—Major E. J. Williams and Captain James H. McGarry.

Denmark.—Dr. A. C. Bornemann.

Guatemala.—Dr. Don Ramon Bengoechea.

Italy.—Major Carlo Maurizio Belli and Captain Meriggio Serrati.

Mexico.—Dr. Eduardo R. Garcia.

All of the countries which have been invited through our State Department to send delegates have not yet been heard from and it is expected that a number of additions to this list will be made. Private advices indicate that France will have three medical officers of the Army present and in accordance with the usual practice Great Britain will have one delegate in attendance. As the British Navy was represented last year we may expect to have an army medical officer this year. The British Army and Navy are now represented on alternate years.

All indications also point to a large attendance from this country. The place of meeting, Baltimore, being such a central point as well as one which it will be a pleasure to visit, will conduce notably to this result. Moreover, the short distance of Baltimore from Washington will result in a large attendance of medical officers of the regular establishment from the latter city.

This year's business and literary program will be as follows:

Tuesday, October 1—

Business Meeting (for members of the Association only).

Wednesday, October 2—

Military Hygiene.

Thursday, October 3—

Organization and Administration.

Friday, October 4—

Military Medicine.

Military Surgery.

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In accordance with the usual practice the meeting of the executive council will be held in the evening of the day preceding the meeting. This year the council will meet at the Belvedere Hotel at 8.00 p. m., Monday, September 30.

Advices received from the Literary Committee indicates that while a number of papers have been contributed for the meeting there is likely to be room on the program for all that are received. Contributions of papers by members are therefore earnestly invited. Such papers may be sent either to the Chairman of the Literary Committee or to the Secretary. Titles of articles may antedate the papers themselves.

The local committee of arrangements has already determined on its part of the Baltimore program. This will be as follows: on Tuesday, October 1, clinics at the Hopkins, University, Mercy and Maryland General Hospitals. At nine in the evening of this same day a reception for the President of the Association will be given at the Hotel Belvedere.

On Wednesday, October 2, the public meeting will be held at a place to be subsequently selected. This will be at 9.00 p. m. and will be followed by a smoker.

For Thursday a unique entertainment is planned. This is a trip to Annapolis by water with a visit to the Governor of Maryland and to the Naval Academy. This is rather a long trip and will start at 9.00 a. m. A session of the Association will be held on the boat en route.

Friday, the ladies in attendance at the meeting will be given an automobile ride to Greenspring Valley and in the evening at 9.00 p. m. an officers' ball will be held at the Fourth Regiment Armory.

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EDITORIAL

THE subject of transportation of sick and wounded in campaign is of such great importance that no excuse is necessary for discussing it, though it is true that much that can be said in this connection has been said many times before. The various agencies through which such transportation is effected are, of course, bearers, vehicles for use across country, railway trains and ships. It would therefore appear to be clear that in order to provide efficient transport from front to rear every means should be taken to increase the efficiency and capacity of each of these factors.

First, so far as bearers are concerned, they must be strong men physically on account of the considerable distances wounded now have to be carried on the battlefield. Moreover, only men imbued with the soldierly spirit are fitted for this task. Wounded must be rescued under fire, very often under very heavy fire, and the bearer does not even have the satisfaction of hitting back which helps so much to sustain and encourage his brother, the combatant. It is obvious, too, that in war every effort should be made to bring the bearers to the field of battle where their work properly begins without exhausting them physically. With this end in view they cannot carry heavy loads immediately prior to an engagement. First, therefore, it is apparent that the weight of the equipment of the hospital corps man should be reduced to the absolute minimum. Secondly, so far as possible the bearers' loads should be transported for them on a march before a combat. This, even at the risk of breaking down some animals for the needs of the front are paramount and here bearers only can be made of use. Moreover, the litter for use at the front should be as light in weight as is consistent with its primary purpose of sustaining the weight of a wounded man in a comfortable position during comparatively short transport by hand. Anything further than this is superfluous and will add to the already heavy work of the bearers. Desirable as they are for many purposes, it is a serious question if for use at the front legs should be found

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on litters. There is, of course, nothing to prevent legs or other additions being made later. Distributing the litter between two bearers has some advocates. The Austrians, for example, have one bearer carry the side poles and another the canvas and cross pieces. Naturally, the objection to this is the time consumed in assembling the litter when it is needed.

The vehicles for use across country are wheeled litters and horse-drawn and motor ambulances. The travois is in the same class. It will be noted that nothing has been said in regard to transport of wounded on horse or mule back. Desirable as such transport would be, the mechanical difficulties respecting its efficient application makes it of little importance except under abnormal conditions. The wheeled litter has not received as much attention in this country as on the continent. There is good reason for this, for we do not use man power to propel vehicles nearly as much as most other countries. In war, however, the wheeled litter will undoubtedly find an important place for itself. It is hardly thought that they should be found in the equipment for the front, but knock-down litters of this class could to advantage be made available in the lines of communication so that they might be made of use in clearing field hospitals. It is obvious that after a serious engagement horse-drawn and motor vehicles will not be of sufficient capacity to transport all wounded requiring careful and gentle carriage. The wheeled litter will constitute an important supplement. It requires but one man while for any considerable distance a carried litter requires four, thus the former is far more economical. The best type of wheeled litter is by no means settled. The essentials would appear to be lightness, strength, simplicity and that it may be knocked down so that it makes a flat package occupying comparatively little space. The wheeled litter is also very convenient on the lines of communication and at home for the transport of lying down patients for short distances.

Opinions differ considerably in respect to the value of the travois. This apparatus, according to the testimony of competent observers, was of great use in some of our Indian campaigns. It would be equally valuable now under like circumstances. It possesses the advantage of being very light and compact so that

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it may be easily carried to the front. In war on a large scale its disadvantages are, however, that it requires one horse and one man to transport one patient, and it is argued that for this reason it is not economical.

Horse-drawn vehicles are of two classes, two wheel and four wheel. The former may again be divided into galloping ambulances and ordinary ambulance wagons. Possibly the galloping ambulance whose purpose is, of course, to take the place of bearers in removing wounded from the field under fire has not been given a fair trial. At all events at the present writing it has not received sufficient commendation to recommend it for adoption by the medical departments of armies. The choice between a two-wheeled ambulance of the ordinary type and the four-wheeled ambulance would appear to depend principally on considerations of economy in animals. It has been claimed that the former has considerable advantages over rough country, but this is probably not the case unless unnecessarily heavy four-wheeled vehicles are used for ambulances. The two-wheeled ambulance which has received special commendation is the Finnish cart which was used to some extent by the Russian army in Manchuria. It is understood that since the Russo-Japanese War this ambulance has been made considerably lighter in weight. Very possibly these ambulances differed in weight at the time of the war. At all events some of them were far too heavy to be of much use. The advantage of only using one horse for the transport of four wounded lying down is, of course, very great, and it would seem as though further experiments to improve an ambulance of this class might be justified by the results. For our transportation we rely principally on our four-wheel, four-horse ambulance. This is generally considered a very good vehicle for its purpose, but it is not particularly economical in animals. An excellent suggestion in this connection was recently made by one of our medical officers. He submitted a drawing showing how by eight lying down cases might be carried by this ambulance instead of four as at present. This was done by placing them across the ambulance.

The last word has not been said in respect to motor ambulances, but it is hardly too much to prophecy that within a very

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few years their manifest advantages will result in their replacing horse-drawn vehicles of this character to a very considerable extent.

A simple way to increase greatly wheeled transport for wounded has been taken advantage of by some countries. This has been effected by constructing all supply wagons of ambulance companies and field hospitals (corresponding units) so that they may be easily converted into ambulances. Possibly the future will see the medical department of armies at the front equipped with special wagons which can be used for stores and ambulances interchangeably.

There are, of course, many interesting questions in respect to rail and ship transport of sick and wounded. Probably the consensus of opinion is that in war dependence on special hospital trains and ships is not justified, and that therefore the medical departments of armies should be well prepared to adapt ordinary railroad cars and commercial vessels for hospital purposes.

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NEWS OF THE SERVICES

1st Lieutenant Eben C. Hill, Medical Corps, returned from camp at Mount Gretna to his station, Fort Porter, on account of illness.

Captain Jesse R. Harris, Medical Corps, who has been under treatment at the Letterman General Hospital, Presidio of San Francisco, California, has returned to a status of duty, and on the expiration of a month's leave of absence will report at Fort Slocum, N. Y., for duty.

Lieutenant Colonel Thomas U. Raymond, Medical Corps, recently on duty in the Philippine Islands, joined at Fort Slocum August 6 for duty as surgeon at that post.

Major Sanford H. Wadhams, Medical Corps, left Fort Slocum August 11th; has been doing special duty at the U. S. Military Academy, West Point, N. Y.; will take station at Fort Porter, New York, on completion of that duty.

Major Jere B. Clayton, Medical Corps, Vancouver Barracks, is on temporary duty at Fort McDowell, California, during the absence of Captain Herbert C. Gibner, Medical Corps.

Captain Herbert C. Gibner, Medical Corps, has been ordered to the Letterman General Hospital, Presidio of San Francisco, California, for treatment.

Colonel Daniel M. Appel, Medical Corps, has been relieved from duty at Fort Sam Houston, Texas, and ordered to Headquarters, Central Division, in Chicago, Illinois, as Chief Surgeon.

Lieutenant Colonel William B. Banister, Medical Corps, who has been acting as Chief Surgeon, Central Division, will remain on duty at Division Headquarters as Sanitary Inspector.

Surgeon General George H. Torney left Washington August 14th for New York City on official business.

Lieutenant Colonel Francis A. Winter, Medical Corps, of the Supply Division, Surgeon General's Office, Washington, D. C., inspected the Medical Supply Depot in New York, August 15th.

Lieutenant Colonel Frank R. Keefer, Medical Corps, returned to West Point, August 12th, from a month's leave of absence.

Major Basil H. Dutcher, Medical Corps, has been relieved from duty at Plattsburg Barracks, N. Y., and assigned to Fort Leavenworth, Kansas, as instructor in the Army Service School.

Major Weston P. Chamberlain, Medical Corps, who has been attending the London School of Tropical Medicines, London, England, has gone to Paris, and on the completion of his course and leave of absence for one month and 15 days, will return to the United States about September 22nd to take station at Plattsburg Barracks, N. Y.

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Major George M. Ekwurzel, Medical Corps, has reported for duty at Fort Andrews, Massachusetts.

Captain John S. Lambie, Medical Corps, left Fort McHenry August 11th to take station at Fort Myer, Virginia, Fort McHenry having been abandoned.

1st Lieutenant Samuel S. Creighton, Medical Corps, has been granted a leave of absence for one month on a Surgeon's certificate of disability.

1st Lieutenant M. C. Stayer, Medical Corps, is at Easton, Pennsylvania, on leave of absence.

Lieutenant Colonel Merritte W. Ireland, Medical Corps, until recently in charge of the Personnel Division of the Surgeon General's Office, and later at the Letterman General Hospital, Presidio of San Francisco, California, sailed for the Philippines on the transport "Sherman," leaving San Francisco August 5th.

A son was born to the wife of Major Paul F. Straub, Medical Corps, late of the General Staff, at Des Moines, Iowa, August 5th.

Colonel George E. Bushnell, Medical Corps, returning from the International Congress against Tuberculosis, held at Rome, Italy, was in Washington, D. C., during the past week, en route to his station, the Army General Hospital, Fort Bayard, New Mexico.

Doctor Charles L. Gandy, son of Lieutenant Colonel Charles M. Gandy, Medical Corps, has recently been commissioned First Lieutenant in the Medical Reserve Corps.

Medical Director Henry G. Beyer, U. S. N., will preside over the Section of Tropical, Military and Naval Hygiene at the XV International Congress on Hygiene and Demography, which will be in session in Washington, D. C., from September 23rd to September 28th, inclusive. Surgeon J. C. Pryor, U. S. N., will act as Secretary of this Section, and Surgeon C. N. Fiske, U. S. N., as co-referee. Medical Inspector E. R. Stitt, U. S. N., will be a member of the Committee on Exhibits. Surgeon General C. F. Stokes, U. S. N., will read a paper entitled "Transportation of the Wounded in Battle at Sea." Hospital ships will be discussed by Medical Inspector George Pickrell, U. S. N., and Surgeon E. N. Blackwell, U. S. N. Surgeon G. A. Lung, U. S. N., will discuss Venereal Prophylaxis and special articles on Naval Hygiene will be read by Surgeons F. L. Pleadwell, U. S. N., E. G. Parker, U. S. N., and R. C. Holcomb, U. S. N.

P. A. Surgeon P. E. Garrison, U. S. N., will continue as a member of the Pellagra Commission until October. He is at present in Columbia, South Carolina, conducting his investigations.

Surgeon Raymond Spear, U. S. N., has returned from Stockholm after a visit to Sweden during the past two months.

P. A. Surgeon W. N. McDonell, U. S. N., will remain abroad until the early part of September. He has been on duty with the Olympic Rifle Team at Stockholm, and at certain ranges is considered one of the best rifle shots. Hospital Steward W. A. Sprout, U. S. N., was a member of the victorious rifle team.

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By an Act of Congress, approved August 14, 1912, the name of the Public Health and Marine-Hospital Service was changed to the Public Health Service. The public health functions of the service were extended somewhat and certain changes were made in the salaries of the officers. The following is a copy of the Act:

AN ACT

To change the name of the Public Health and Marine-Hospital Service to the Public Health Service, to increase the pay of officers of said service, and for other purposes.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the Public Health and Marine-Hospital Service of the United States shall hereafter be known and designated as the Public Health Service, and all laws pertaining to the Public Health and Marine-Hospital Service of the United States shall hereafter apply to the Public Health Service, and all regulations now in force, made in accordance with law for the Public Health and Marine-Hospital Service of the United States shall apply to and remain in force as regulations of and for the Public Health Service until changed or rescinded. The Public Health Service may study and investigate the diseases of man and conditions influencing the propagation and spread thereof, including sanitation and sewage and the pollution either directly or indirectly of the navigable streams and lakes of the United States, and it may from time to time issue information in the form of publications for the use of the public.

SEC. 2. That beginning with the first day of October next after the passage of this Act the salaries of the commissioned medical officers of the Public Health Service shall be at the following rates per annum: Surgeon General, six thousand dollars; Assistant Surgeon General, four thousand dollars; senior surgeon, of which there shall be ten in number, on active duty, three thousand five hundred dollars; surgeon, three thousand dollars; passed assistant surgeon, two thousand four hundred dollars; assistant surgeon, two thousand dollars; and the said officers, excepting the Surgeon General, shall receive an additional compensation of ten per centum of the annual salary as above set forth for each five years' service, but not to exceed in all forty per centum: *Provided,* That the total salary, including the longevity increase, shall not exceed the following rates: Assistant Surgeon General, five thousand dollars; senior surgeon, four thousand five hundred dollars; surgeon, four thousand dollars; *Provided further,* That there may be employed in the Public Health Service such help as may be provided for from time to time by Congress.

Surgeon C. H. Gardner of the Public Health Service has been relieved from duty at the Marine Hospital at Wilmington, North Carolina, and has been placed in charge of the Marine Hospital at Detroit, Michigan.

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Passed Assistant Surgeon J. R. Hurley of the Public Health Service has been relieved from duty in the Philippine Islands, and has been directed to proceed to San Francisco, California.

Passed Assistant Surgeon Joseph Goldberger of the Public Health Service is at present in New York City in connection with the collection and examination for possible plague infection of rodents at that place. There is no suspicion that rat plague is present in New York City or vicinity, but the Commissioner of Health is anxious, in view of the plague situation abroad, to inaugurate a campaign for the collection and examination of rats sufficiently extensive to definitely ascertain that rat plague is not present, and to reveal its existence if at any time it should occur.

Passed Assistant Surgeon J. S. Boggess of the Public Health Service, who, for some weeks, has been engaged in the collection of data in regard to the pollution of the Missouri River and its tributaries, with special reference to the conveyance of typhoid fever, has been ordered to the Hygienic Laboratory in Washington for duty.

Assistant Surgeon General W. C. Rucker of the Public Health Service recently spent a few days in New York City in conference with the Commissioner of Health relative to the collection of rodents and the deratization methods to be put in force.

Surgeon L. L. Williams of the Public Health Service has been relieved from duty at the Marine Hospital at Boston, Massachusetts, and is now stationed at the Marine Hospital at Wilmington, North Carolina, relieving Surgeon Gardner.

Edward Francis, Passed Assistant Surgeon of the Public Health Service, and Assistant Director of the Hygienic Laboratory, has been ordered to New Orleans, Louisiana, for duty in connection with the laboratory examination of rats for plague. On July 27, the finding of a plague-infected rat in New Orleans was reported by Surgeon White of the Public Health Service. This rat was found on the water front. No other plague-infected rats have been found, although an extensive campaign has been inaugurated for the collection and examination of rats and many thousands have been thus collected. Measures for the deratization of the water front have been mapped out. This work will be carried on by the health authorities of New Orleans and the State of Louisiana. Surgeon White of the Public Health Service is in immediate charge of the work.

Passed Assistant Surgeon C. W. Chapin of the Public Health Service has been ordered to San Juan, Porto Rico, for duty in connection with the plague suppressive measures being carried on in Porto Rico by the Public Health Service in cooperation with the Department of Sanitation of Porto Rico.

Assistant Surgeon R. H. Heterick of the Public Health Service has been relieved from duty at the quarantine station at San Francisco, California, and has been ordered to proceed to Manila, Philippine Islands, to report to the Chief Quarantine Officer for duty.

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Passed Assistant Surgeon W. H. Frost of the Public Health Service has been ordered to Buffalo, New York, on the request of Dr. Eugene H. Porter, Commissioner of Health of the State of New York, to investigate an epidemic of poliomyelitis which began in Buffalo in the latter part of July.

Passed Assistant Surgeon R. A. Herring of the Public Health Service has been directed to proceed to New Orleans, Louisianna, and report to Surgeon J. H. White for duty in connection with the deratization measures being carried on in New Orleans.

G. O. 207, Navy Department, Aug. 8.

The American National Red Cross, having been authorized by an act of Congress (approved April 24, 1912) to render aid to the land and naval forces in time of actual or threatened war, the following regulations governing the status, organization, and operations of the Red Cross when employed with the naval forces, having received the approval of the President of the United States, are published for the information and guidance of all concerned:

1. The organized Red Cross units serving with the naval forces will constitute a part of the sanitary service of the naval forces.

2. When the Navy Department desires the use of the services of the Red Cross in time of war or when war is imminent, the Secretary of the Navy will communicate with the President of the Red Cross, specifying the character of the services required and designating the place or places where the personnel and material may be assembled.

3. When any member of the Red Cross reports for duty with the naval forces of the United States, pursuant to a proper call, he will thereafter be subject to military laws and regulations, as provided in article 10 of the Geneva Convention of 1906, and will be provided with the necessary brassard and certificate of identity.

4. Except in cases of great emergency, Red Cross personnel serving with the naval forces will not be assigned to duty on combatant ships, but will be employed at sanitary bases, in hospitals, on medical transports and hospital ships, and on other lines of communication. Female nurses will usually be assigned to duty ashore or on hospital ships.

5. Red Cross organizations will not establish independent hospitals or other institutions, but will assist the Medical Department of the Navy as herein provided.

6. Separate establishments maintained by the Red Cross will be placed under the immediate direction of a medical officer of the Navy before naval patients are assigned thereto. Such officer will be held responsible for the administration, discipline, and records of the institution; he will regulate admissions and discharges and see that the interests of both the Government and the patients are conserved.

7. No individuals of the Red Cross Society will be accepted for service

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by the Navy Department until inspected by a medical officer of the Navy and found qualified for the performance of the service expected of them.

8. The Red Cross may be called upon in time of war, or when war is impending, for the following classes of personnel:

(1) Physicians and surgeons.
(2) Pharmacists.
(3) Hospital Corps men.
(4) Nurses.
(5) Clerks.
(6) Cooks and other hospital personnel.
(7) Laborers.

9. The Red Cross personnel available for service with the Navy will be divided into three classes, as follows:

Class (a): Those willing to serve afloat or ashore wherever needed.

Class (b): Those willing to serve anywhere within the continental limits of the United States.

Class (c): Those willing to serve at sanitary bases or hospitals in the vicinity of their places of residence.

Class (a) will be organized into sections and divisions and equipped as may be prescribed by the central committee of the Red Cross and approved by the Navy Department. The individuals composing such sections and divisions will be trained for service aboard the medical transports, hospital ships, and at sanitary establishments beyond the seas.

Class (b) will be trained for service in hospitals and other sanitary institutions that may be established within the continental limits of the United States. Individuals of class (b) may also be organized into sections and divisions and uniformed and equipped as prescribed for class (a).

Class (c) will be composed of individuals of the local Red Cross who, on account of their occupation or training in the care of sick and other hospital duties, may be relied upon to render efficient service at sanitary bases of naval hospitals in the vicinity of their places of residence.

10. The Red Cross service shall be divided into transport service, hospital service, and information-bureau service. Members properly qualified may serve in any branch.

11. The Red Cross service and organization on a medical transport or hospital ship will be under the direction of the medical officer of the Navy in command.

A unit of the transport or hospital service will be a section composed of two individuals.

A division will be composed of 20 sections.

Each division shall have, in addition, one hospital steward.

Divisions shall be in charge of officers of the Naval Medical Corps, Naval Medical Reserve Corps, or physicians of the Red Cross.

12. The service at a sanitary base or naval hospital will be under the medical officer of the Navy in command.

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Hospital divisions must be prepared to supplement and assist regular naval hospitals and to be assigned to certain branches of hospital work, such as the management of kitchens, etc.

13. The training of transport divisions shall assimilate that of the Naval Hospital Corps and include instruction in first-aid, elementary hygiene and hospital corps drill. The personnel of such divisions shall be made practically familiar with the methods for transporting sick and wounded aboard ship.

14. The training of hospital divisions shall include, in addition to the training of transport divisions, practical instruction in methods and material used in hospitals and sanitary establishments. Some of the personnel of each division should also be made proficient in the methods of disinfection. Hospital divisions, or any part thereof, may also be assigned to duty on hospital trains and to other naval sanitary institutions.

15. Information bureau divisions will be composed of clerks, stenographers, and typewriters, who will serve under the immediate supervision of officers of the Red Cross, and will be instructed in methods of correspondence and obtaining the necessary information from authorities concerning sick and wounded and data for the purpose of furnishing such information to relatives and friends. Information bureau divisions may also be attached to the bureau of information for prisoners of war.

16. A register will be kept in the office of the Surgeon General of the Navy, upon which will be entered the name, place, strength, equipment, and efficiency of Red Cross organizations. No organization will be entered on the register, however, until it shall have been approved by the Surgeon General of the Navy. A Red Cross organization that has been found qualified will be carried on the register for one year after the date of such registration.

17. Applications for registration upon the Surgeon General's register will be forwarded through Red Cross channels to the Secretary of the Navy.

18. Applications already borne on the Surgeon General's register, for continuance on the said register, will be submitted annually on or about June 1, through Red Cross channels, to the Secretary of the Navy.

19. The personnel serving with the land and naval forces in time of war or threatened hostilities, while proceeding to their places of duty, while serving thereat, and while returning therefrom will be transported and subsisted at the cost and charge of the United States as civilian employees with said forces. Red Cross supplies that may be tendered as a gift and accepted for use in the sanitary service will be transported at the cost and charge of the United States.

20. When available, suitable quarters may be assigned to the Red Cross in active service.

Approved:

WM. H. TAFT.

The White House, Aug. 9, 1912.

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Thomas Brown McClintic, Passed Assistant Surgeon in the United States Public Health Service, died of Rocky Mountain (spotted) fever in Washington, D. C., August 13, 1912. The fatal illness was contracted in line of duty while investigating Rocky Mountain (spotted) fever in the Bitter Root Valley, Montana. His death was a severe shock to his many friends. Interment took place the afternoon of August 15 at Warm Springs, Virginia.

Passed Assistant Surgeon McClintic was born at Fort Lewis, Bath County, Virginia, December 27, 1872. He received the degree of Doctor of Medicine in the University of Virginia in 1896, and after a tour of service in hospitals in New York City, entered the Public Health Service July 25, 1899. Doctor McClintic had a wide experience in the work of the service to which he belonged, having been engaged for several years in research work at the Hygienic Laboratory, at various quarantine stations and marine hospitals, and in yellow fever work in Tampico, Mexico. He is best known to many because of his work on the practical use of disinfectants and of his more recent studies of Rocky Mountain (spotted) fever. He took up the study of this disease in the spring of 1911 in Montana, returning again in March of the present year to be present during the season when the disease prevails in that locality. It was while engaged in the laboratory examination of spotted fever in the Bitter Root Valley that he contracted the disease.

Doctor McClintic was a capable and experienced officer, and in his death the Public Health Service has sustained a distinct loss.

Doctor McClintic was married in March, 1912, to Miss Theresa Drexel of Washington, who survives him.

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The Military Surgeon

Vol. XXXI. OCTOBER, 1912 No. 4

ORIGINAL ARTICLES.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS EXPRESSED IN THEIR CONTRIBUTIONS.

THE MEDICAL DEPARTMENT OF THE UNITED STATES IN THE CIVIL WAR.

The Great Battle of the West, Chickamauga.

By Captain LOUIS C. DUNCAN, Medical Corps, U. S. Army.

THE battle of Chickamauga was the greatest battle fought in the West. On no other field west of the Alleghenies were the contending forces so numerous, the contest so long and deadly, or the losses so great. Moreover, the conflict took place in a rugged, sparsely settled country, far from bases of supply, under conditions that made the work of the Medical Department extremely difficult. To render bad conditions still worse, the national forces were driven from the field in a manner nearly approaching a rout. Yet the management of the wounded was decidely better than in the somewhat similar second battle of Bull Run (fought, however, a year earlier), waged by the Army of the Potomac.

THE ARMY.

The contest in the valley of the Chickamauga was waged for the Union by the Army of the Cumberland, the only army of the West that had a separate and continuous existence through the greater part of the war; the only army that may be said to have

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had a personality like that of the Army of the Potomac in the East. This army had been organized by General Buell at Louisville very early in the war. It had arrived on the field at Shiloh in time to turn defeat into victory; had fought successfully at Luka and Corinth. In the late summer of 1862 it was in front of Chattanooga, almost in the same position as we shall see it now, a year later. Then it had raced across two states with Bragg for the possession of Louisville, and had won the race. After a drawn battle at Perryville it had occupied Nashville again, and on the last day of the year 1862, once more engaged Bragg's Confederate Army at Murfreesboro, or Stone's River. Defeated on the first day, this army had, without help, turned defeat to victory two days later, and occupied Murfreesboro. This brief record is recited to show that in the Chickamauga campaign, General Rosecrans had a veteran army, an army that had marched and fought all over Kentucky and Tennessee for two years with the worst mark against it, a draw at Perryville.

After the exhausting battle at Stone's River, the Army of the Cumberland remained at Murfreesboro for months; resting, refitting, and reorganizing for the next campaign. The battle ended January 2, 1863. Despite repeated urging from Washington and favorable contemporaneous campaigns east and west Rosecrans did not move from his camp until June 24th, thus taking a period of practically six months in preparation for the conquest of Chattanooga.

During this time the army was reorganized into three army corps, a small reserve corps, and a cavalry corps. Thomas' 14th Corps had four divisions, numbering about 25,000 men; McCook's 20th Corps consisted of three divisions, 12,000 men; Crittenden's 21st Corps also had three divisions amounting to some 14,000 men; Gordon Granger's Reserve Corps was in reality a division of four brigades, about 5,000 men. The Cavalry Corps was made up of two divisions, five brigades, eighteen regiments with three batteries attached, and in round numbers amounted to 10,000 men. The infantry and artillery numbered about 51,000 men, but this number was materially reduced by losses and by the detachments of three brigades before the battle.

There were eleven infantry divisions, with 30 brigades, 122 regiments, and 30 attached batteries actually engaged. The total num-

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ber of men in these organizations on the days of the battle was, as nearly as can be ascertained, forty-four thousand.

The infantry regiments numbered a little less than 400 men each, the cavalry rather more.

This was the number actually present and equipped for duty, the number of muskets that could be put on the firing line. The muster rolls of these 122 regiments contained twice this number of names.

The Medical Director says that when the army began the campaign the sick report amounted to about 5% of the command; at the time of the battle it was 4%. But this figure only shows the sick present with the army. About twice this number was in the hospitals in the rear, on sick furlough, or in some way absent sick.

MEDICAL ORGANIZATION AND EQUIPMENT.

The Army of the Cumberland, having been in existence for two years, had time to have and did have an excellent organization and equipment in most respects. Surgeon Hart, who had seen service with both armies, says that the medical arrangements were not on an equality with those of the Army of the Potomac. Possibly not in details. It was operating far from its base, in a difficult country, while the Army of the Potomac was always within a few miles of its base with transportation lines unobstructed.

What was of more importance, the latter army was near the throne—Washington. As General Johnston complained to the authorities at the Capital, their own danger was most immediate and supplies were readily forthcoming.

The field hospitals were in a transitional state. Each regiment had a hospital; these were combined to form brigade hospitals, in time of battle the brigade hospitals were collected to form what might be called a division hospital. The material was pieced out from the medical supply trains, of which each corps had one. It will be seen that there was a lack of methodical organization and work. There was a sufficient number of medical officers, apparently about three hundred. Although fifty were left on the battlefield there was still no lack. A peculiar thing about the medical officers of this army was that nearly all the division and even corps surgeons were volunteer officers, and as a rule they were

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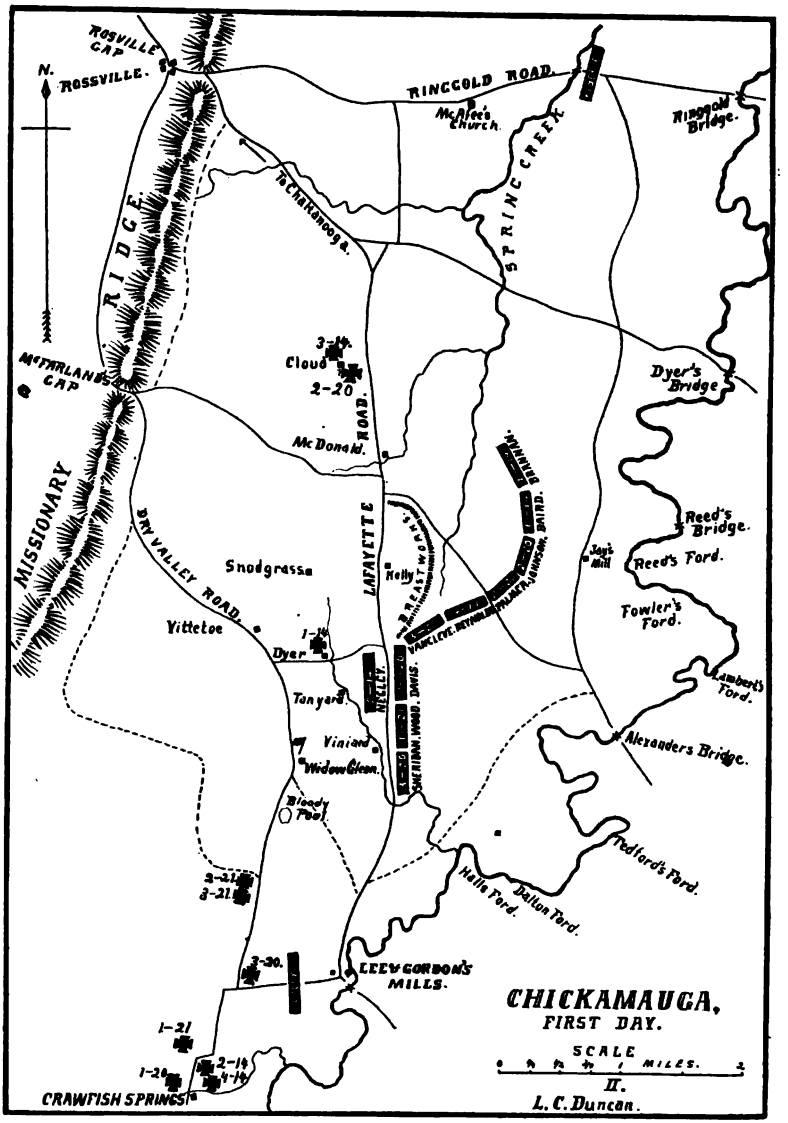

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surgeons detailed or promoted from state troops. There were less than a half dozen regular medical officers in the whole army.

As to ambulances, the army was abundantly supplied, but the personnel left considerable to be desired. In the beginning of the war the western armies, like the eastern, had regimental ambulances only. Later they were combined in brigades and division trains; in time of battle. Finally in the spring of 1863, division ambulances were provided, but the regimental ambulances were also retained. The Army of the Cumberland at the outset of this campaign was provided with a train of thirty ambulances for each division of from 3,500 to 5,000 men and had in addition thereto one ambulance for each regiment and battery. There was a slight shortage in some of the divisions but the supply as a whole was ample as shown by the following table of forces and ambulances at the time of battle.

14th Army Corps,	20,000 men,	181 ambulances.
20th Army Corps,	11,500 men,	105 ambulances.
21st Army Corps,	12,500 men,	121 ambulances.
Total	44,000 men,	407 ambulances.

The ratio is 1 ambulance to each 110 men. The division ambulance trains alone contained 300 ambulances or one to each 145 men. These were all four wheel ambulances, carrying but two recumbent patients. The Medical Director of the Army says in his official report that the regimental ambulances were of little use, being generally loaded with officers' baggage and other articles. It is easy to see that they could be of little use in any case, being scattered and subject to no efficient systematized control. The ambulance trains were under the general control and management of the Quartermaster Department and had several grave faults. For example there was no ambulance corps. The drivers appear to have been detailed from the line, and as to men for loading and unloading the wounded, there were none; the ambulance drivers had to depend on band men and others whose help was at hand, or were detailed for each particular case. Another serious fault was that the division ambulance trains were not in charge of commissioned officers. For each ten ambulances there was an ambulance master, who seems to have been a sort of wagon boss. The division train was under charge of the division quartermaster. This

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is one of the things that Surgeon Hart thought inferior to the Army of the Potomac, as no doubt it was. But this was a minor fault, a detail. The ambulances were combined in division trains, they worked as division units, and they did their work reasonably well.

During the battle they brought wounded off the field as long as they could go on the field, only stopping when in imminent danger of being captured. Even then they were all loaded with wounded and escaped to Chattanooga. There was no panic as at Bull Run, and many ambulances that were cut off and given up as lost made their way through by-roads in the woods and came into Chattanooga in safety.

Wounded were left behind, but chiefly on the field, and because it was abandoned in rout.

Before beginning the campaign the regiments drew medical supplies for three months and Medical Director Perrin says, "Everything that related to preparations in the Medical Department for a vigorous campaign was in readiness and as complete in appointment as could be desired."

The Army of the Cumberland at this time had not adopted Letterman's system of brigade supplies and did not adopt it until Jan. 1, 1864; instead there was a system of regimental and corps supplies. Each regiment had a wagon load of supplies as in the Army of the Potomac before October 1862. This allowance included a hospital tent, and these regimental tents made up the division hospital in time of battle. The regimental supplies were also then drawn on. Unfortunately in one of the corps (the 20th), these supplies were reduced to 500 lbs. on crossing the Tennessee River and the hospital wagons taken away. This corps suffered as a consequence.

In addition to the regimental supplies there was a reserve supply for each corps, carried in a train of army wagons. The 14th Corps had a reserve supply train of 19 six-mule wagons, the 20th Corps had eleven wagons, and the 21st had fourteen. These trains carried not only medicines and dressings but also food, clothing, blankets, and hospital tents. It will be seen that a train of 11 to 14 wagons for a corps not so large as our modern division, could carry a considerable amount of supplies. In the battle the Medical Purveyor of the 20th Corps was obliged to issue hospital tents to his three divisions and they were all lost.

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The base of the army was at Nashville, where there were fixed hospitals of about three thousand beds capacity. Further back at Louisville and other posts along the Ohio River there were hospitals with a total capacity of at least twelve thousand patients. At Murfreesboro, the advance base, a large tent hospital of 1,500 beds had been organized and equipped with bedding, cots, etc. This hospital was sufficiently mobile to be advanced along the railway somewhat in the rear of the army. It was later brought up to the Tennessee River and used there at the battle of Chickamauga.

Stevenson and Bridgeport, on account of the peculiar configuration of the terrain, were better situations for hospitals than Chattanooga, so long as the retention of Chattanoga was not absolutely assured.

This hospital was in actualty an evacuation hospital and was so used.

The army had excellent hospital trains operating on the Nashville and Chattanooga Railway. As the army advanced the road was repaired and at the time of the battle of Chickamauga trains were running as far as Bridgeport. The bridge over the Tennessee at that point had been destroyed by the Confederates and was not rebuilt until long after the battle.

THE MARCH.

After repeated urging from Washington Rosecrans finally advanced from Murfreesboro on June 24, 1863. The three corps marched by different roads in the general direction of Manchester and Chattanooga. The Confederate Army was in position about Tullahoma and this first phase of the operations is often spoken of as the Tullahoma Campaign. Although when Tullahoma was entered the army rested for several weeks, this was not, properly speaking, a campaign.

The real objective was Chattanooga. The whole series of operations up to Chickamauga consisted of strategic moves for the posession of certain points, rather than an effort to find and destroy Bragg's army.

The whole should be called the Chattanooga campaign, beginning with the advance from Murfreesboro on June 24 and ending with the battle of Missionary Ridge on November 25, five months later.

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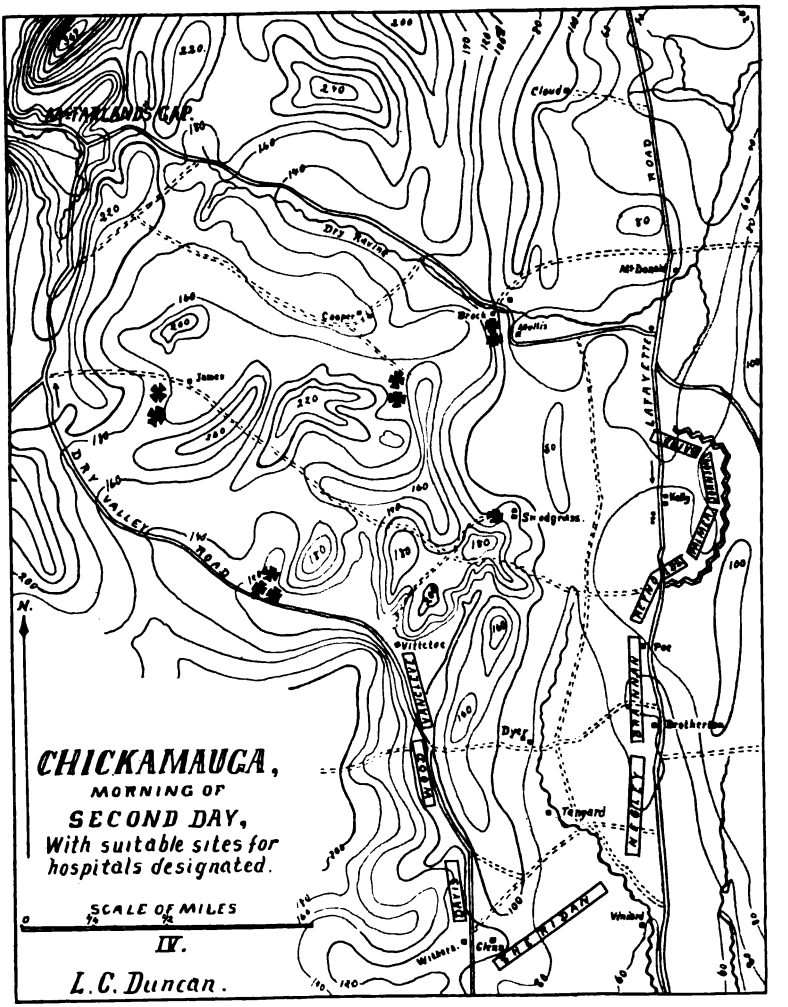

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Shortly after the army commenced its forward movement heavy rains set in, continuing almost without interruption throughout the Tullahoma campaign. The miserable dirt roads leading through the wooded ravines and hills of the barrens of Southeast Tennessee became all but impassable. Wagons stuck fast, the guns could only be moved by doubling teams, and then with the greatest difficulty. Even the movements of the foot troops were materially retarded by the soft glutinous soil in which the soldiers sank half knee deep at every step. The men, soaked and chilled by the rain, suffered terribly, and though the advance was only twelve miles a day the fatigue was greater than in the race for Louisville the year before, when twenty-five and twenty-seven miles were covered day after day.

The rains continued and the roads became even worse as the Cumberland Mountains were reached, but the army pushed steadily forward and entered Tullahoma July 1. There had been a little skirmishing, but no real engagements. The whole loss in killed and wounded was less than six hundred. Despite the continuous downpour of rain and the atrocious roads there had been no more than the ordinary amount of sickness, from 4% to 5%. An accurate observer and careful writer who took part in this campaign says, "During the ten days occupied in marching from Murfreesboro to Winchester, not one passed without a heavy shower and sometimes for twenty-four in succession the rain fell incessantly. The clothing of the men was never thoroughly dry and rations were at all times scanty. Many of the men wore out their shoes before they had marched three days, and were barefoot the rest of the time. But they kept up their spirits and bore their hardships uncomplainingly."

The sick and the wounded of the first fights (Hoover's Gap, June 24, and Liberty Gap, June 25), about four hundred in number, were sent back to the hospital at Murfreesboro, which had been cleared for them. On reaching Tullahoma a number of tents abandoned by the enemy were used for hospital purposes and a hotel building was converted into another, with a capacity of 100 beds.

Having achieved the first stage of the Chattanooga campaign Rosecrans now sat down at Tullahoma and remained until the Washington authorities again pushed him out—August 17.

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McCook's Corps was on the right at Winchester, Thomas in the center at Tullahoma, and Crittenden on the left at Manchester and McMinville. The Reserve Corps was back along the railway and the cavalry in the front and on the flanks.

Tent hospitals had been established at all these places and one-half of the large hospital at Murfreesboro was brought forward to Cowan, a small station at the foot of the mountains.

On August 5, Rosecrans received a peremptory order to advance and on the 17th his three army corps moved forward on parallel lines toward the Tennessee River. The sick and wounded were all first sent to the rear and the army moved unincumbered. Sheiridan's division had already advanced to Stevenson and the remainder of the Murfreesboro hospital was advanced to that point. The army met with little opposition and by August 30 had reached the river. The roads were again all but impassible and the march was slow.

McCook's corps crossed at Caperton's Ferry, Thomas at Bridgeport and Crittenden at Shellmound. By September 4 the whole army was across the river.

The great railway bridge at Bridgeport having been destroyed that point became the rail-head of the column. In addition to the hospital at Stevenson a smaller tent hospital was established there. During all this time the railway hospital train was kept running regularly and all serious cases were removed promptly to Nashville.

The field hospitals and large tent hospitals were kept practically empty, in preparation for expected combat. Supplies were brought up from the rear for all these hospitals, leaving the reserve supply trains with the various corps intact. At Stevenson and Bridgeport were now what we should call the evacuation hospitals for the final advance on Chattanooga and the battle that was to follow. Up to this time there had been but few casualties, but once south of the river a collision with the enemy was looked for at any time.

The Medical Director says, "I made every effort to familiarize myself with the topographical resources of the country. As a great struggle was anticipated, food for the wounded and an easy way to the rear were the main points to be kept in view." These were the main difficulties that were met with in the East also. It

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was never medicine or surgical needs that were too great to be met, but simple things like food, blankets, tents, ambulances, and trains. These are the things that almost every medical director and every medical officer found to fail from Bull Run to Appomattox.

The hospitals on the Tennessee River were sufficient for all needs until the army penetrated the gaps of Lookout Mountain. Then Bragg evacuated Chattanooga and the Medical Director ordered Surgeon I. Moses, U. S. V., to proceed from Murfreesboro to Chattanooga and establish a hospital of three thousand beds. Supplies were also ordered forward but events moved too rapidly.

Surgeon Moses reached Chattanooga on September 18, only one day before the battle began. He says, "I repaired to Chattanooga and arrived on Friday, September 18, with orders from Surgeon Perrin, U. S. A., to prepare beds for three thousand wounded. I found scant supplies for not more than 500 beds, and buildings capable of holding that number, built by Confederates and occupied as a hospital, with about 150 sick already in them; also a large building, two stories, built by the Confederates as a receiving hospital, capable of holding 150. These buildings were without doors or windows, and destitute of every convenience. A partial supply of medicines, blankets, furniture, and dressings were on hand estimated for 1,000 men, but deficient in many articles. I selected several buildings which might be converted into hospitals." Various buildings, hotels, lofts, churches, and private buildings were selected and they were all needed before the battle was over.

The shortage of supplies could hardly have been avoided. It would naturally be supposed that on taking Chattanooga Rosecrans would halt there to refit his army, bring up supplies, receive reinforcements and spend some time in preparations before again proceeding deeper into the enemy's country, there to meet an army still unbeaten.

But he seems to have been carried away by his own success, and plunged recklessly into the valleys and mountains below Chattanooga without the preparations that prudence would have dictated. After Grant took command it was nearly six months before Sherman again took up the campaign for Atlanta, and previous to setting out he made careful preparations.

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These things are mentioned to show why there were not proper and sufficient supplies and hospitals at Chattanooga, such as one would expect at the advance base of the army, and such as were there in abundance before so bold a leader as Sherman undertook a campaign through the mountains of northern Georgia.

After passing the Tennessee River Rosecrans had several high ridges and deep valleys to cross before reaching Chattanooga: Sand Mountain, Lookout Valley and Lookout Mountain. The ridges were from fifteen hundred to two thousand feet high. Through the main obstacle, Lookout Mountain, there were but three practicable passes for an army: one near the river, Stevens Gap twenty-five miles south, and a third at Valley Head, forty miles south. The three corps marched for these gaps, McCook on the right to Valley Head, Crittenden advanced along the river to Chattanooga. On September 7 the various corps appeared at the eastern outlet of these gaps and next day Bragg evacuated Chattanooga, retiring southward to Lafayette and Dalton. Crittenden entered Chattanooga on the 9th, left a brigade there, and pushed on by Rossville toward Ringgold. The other corps had marched forward and crossed still another ridge, Missionary Ridge, which is not a mountain range, but a long ridge from two to four hundred feet high.

By the 12th Rosecrans found that Bragg was not in retreat as he had supposed, but had his army well concentrated and was advancing down the valley of the Chickamauga, the valley next east from Missionary Ridge. Rosecrans called in his widely separated corps.

After crossing the Tennessee the weather was extremely dry. The country was almost a wilderness of rocky hills and valleys. The days were warm and the thousands of marching feet ground the soil into a powder that rose in clouds of choking dust. The nights, however, were so cold as to make a fire comfortable.

While Rosecrans was advancing boldly into Georgia, Bragg was calling aid from the whole Confederacy. Divisions were brought from East Tennessee, Mississippi, and a whole corps from Virginia to give him the preponderance in numbers, while Rosecrans, who might easily have been reinforced from Vicksburg, remained with an inadequate force, far from his base, in great danger of defeat and consequent ruin.

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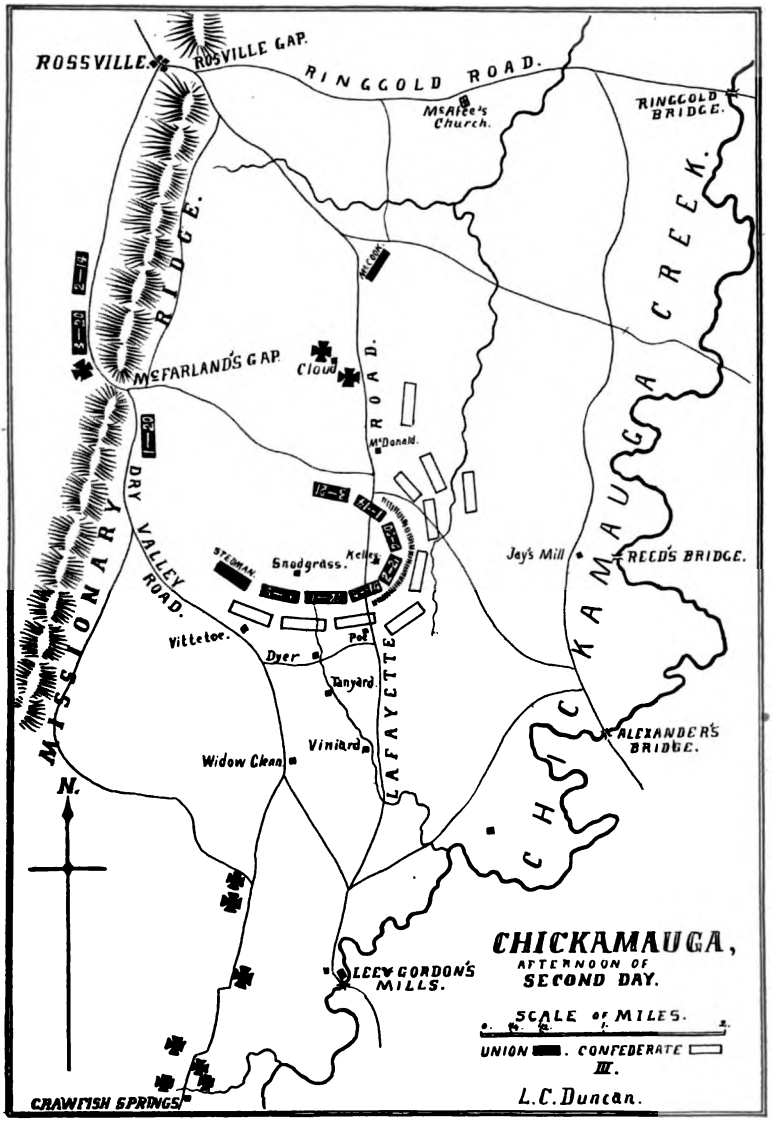

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Bragg, now superior in numbers, advanced down the eastern side of Chickamauga Creek, while Rosecrans called in his divisions, to the western side of that stream, in the vicinity of Lee and Gordon's Mills. By the morning of September 18, Bragg's whole force, excepting Longstreet's corps, was ready for battle. On the Union side Crittenden alone was on the field, Thomas was at Pond Spring, and McCook at Stevens Gap, both hurrying up. Gordon Granger was at Rossville Gap, the cavalry in front.

Map II shows the configuration of the battlefield and the lines on the first day of the battle, September 19, but it does not show one very important point, Chattanooga, and its relation to the field.

Now Chattanooga is almost directly north from Rossville, a distance of about six miles. Chattanooga was the temporary advance base of the army. To it the army must inevitably go in case of defeat.

Now looking at this map again, one sees without difficulty that the line of retreat must be along the west side of Missionary Ridge from McFarland's Gap to Rossville and on north in the same line to Chattanooga. The army was to fight on a line parallel to its line of communication, with its base on the left flank, a perilous situation at the best.

In case of defeat the whole army must be poured through McFarland's Gap, where the rugged Missionary Ridge would serve as a screen and protection for a safe retreat to Chattanooga. There is but one other gap in this ridge, Rossville Gap, and Gordon Granger's Reserve Corps was posted in front of this vital point to guard it.

The location of Crawfish Springs should also be noted and borne in mind; it is about three and one-half miles from the center of the field, but on the right flank, in the enemy's country, and directly away from the base at Chattanooga.

Rosecrans, Thomas, and McCook came on to the battlefield by way of Crawfish Springs; an ignorant soldier might instinctively feel that he would retreat in the same direction.

Crittenden came to the field from Chattanooga by Rossville Gap, but moved to Lee and Gordon's Mills before the battle.

Medical Director Perrins says, "It was soon discovered that the main body of the enemy was moving down the valley of the

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Chickamauga towards Rossville. The ridge that divides the valley of the Chickamauga from that of Chattanooga (Mission Ridge) was traversed in several places by wagon roads (McFarland's Gap and Rossville Gap).

It was by these roads that our wounded must be conveyed to the rear. The wagon road down the Chickamauga Valley was nearer the base of the ridge, on the south side (east) where there were few springs. As every indication pointed to a conflict on the north side of the creek, our wounded were to be provided for at these springs, or taken over Missionary Ridge into Chattanooga Valley.

After consultation with the general commanding (Rosecrans) I selected Crawfish Springs as the main depot for wounded. Division hospitals for the 20th and 21st Corps, together with two divisions of the 14th Corps, were accordingly established at that point."

Thus of the ten division hospitals with the army (there is no record of a division hospital wih the Reserve Corps) eight were established at or near Crawfish Springs.

One of them, second division, Twentieth Corps, was soon removed to a point on the Lafayette Road, probably near the Cloud House, but seven out of the ten remained there throughout the battle, and afterwards.

There is but one reason for locating these hospitals at this point, the abundance of water. Following the rains of June and July a period of drouth ensued. The roads were dusty, the fields dead, and the streams dried up. The hills back of the army and up to Missionary Ridge were especially destitute of water. The southern road to McFarland's Gap was known as the Dry Valley Road. A pool near the Widow Glenn House was known as bloody pool. Either side strove for its possession and when the blue or gray was successful the men dropped at the water's edge to drink, though dead men and horses lay in it before their eyes.

In those days water was a prime requisite of the hospitals and dressing stations. Every wound was washed if possible and the simple "water dressing" took the place of our modern first dressing. Then there were the ordinary needs of water for drinking and cooking, always present. For no other good reason

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could all these field hospitals have been located at Crawfish Springs.

A mere glance at the map shows the line of retreat for all divisions to have converged at McFarland's Gap. From there the road led straight through Rossville to Chattanooga. Everyone in both armies from general down to private knew that Rossville Gap was a vital point.

Yet the trains were parked and seven out of ten field hospitals were established at Crawfish Springs; not only out too far on the flank, but on precisely the wrong flank, and in the enemy's country where in case of defeat they could hardly fail to be cut off.

If on map II one should draw lines from each division to a common center at McFarland's Gap and then mark points on all these lines one and a half to two miles in rear of the divisions he will have the ideal locations for the field hospitals.

In order to conform to topography, roads, and other natural features of the terrain the actual locations would vary from the ideal. But since the army was divided into two wings, each with a road leading back to the gap, it seems clear that the hospitals should have been near these roads, those of the right wing somewhere near the Vittetoe House, where a division hospital was actually located, and those on the left wing back of the Lafayette Road, and north of the Snodgrass House.

The field hospitals located at the Cloud House were too far out on the flank. Flanks were uncomfortable places when Joe Wheeler and Forrest were around.

The various field hospitals were scattered along a line about seven miles in extent, while the actual fighting line occupied not more than half that distance on the first day and still less on the second; on the last afternoon not more than one mile.

If on map II one should draw a line from each division to its actual hospital he would have a fine crisscross of lines. It would be by accident that any wounded man found a hospital of his own division. Such an arrangement must invariably result in complete confusion for the wounded.

In fact the mixing up of the divisions themselves is generally conceded to have been a principal factor in the loss of the battle.

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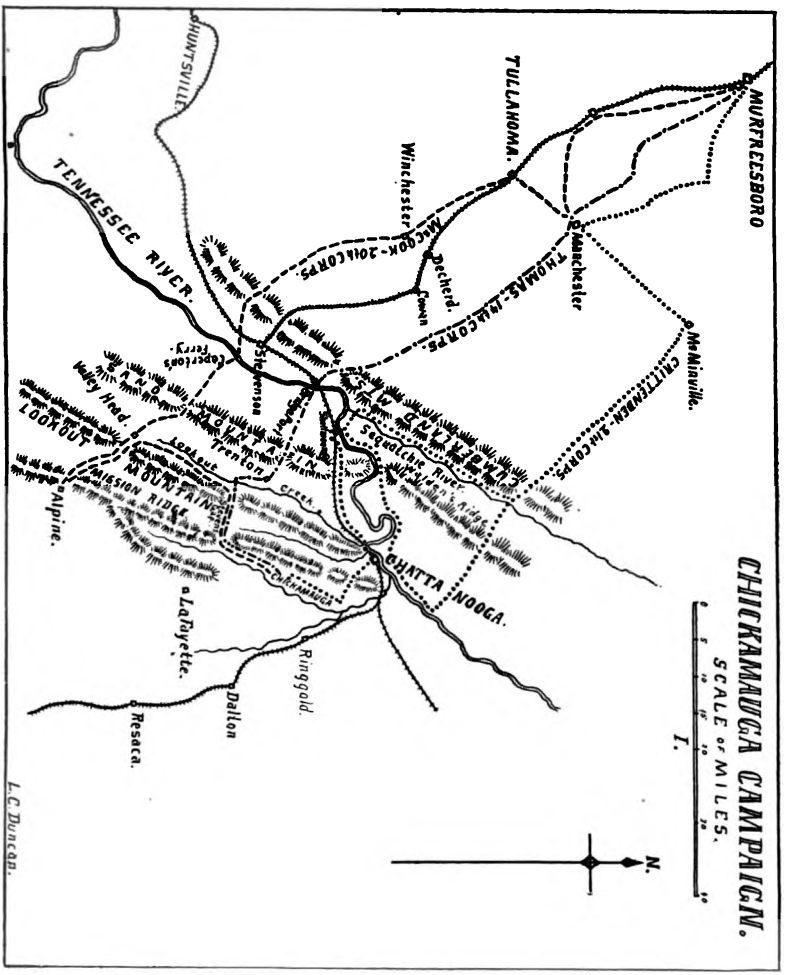

THE BATTLE: FIRST DAY.

The battle was opened by Thomas, near Jay's Sawmill, at 8:30 Saturday morning. Bragg aimed to attack, but Thomas was first. His corps had marched the whole night steadily and reached the field at daylight. Crittenden had been at Lee and Gordon's Mills and further north for several days. McCook was below Crawfish Springs and hurried forward at the sound of the guns, marching the last five miles at double time. His first

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division (Wood) was up by noon, Davis got into the fight in time to lose half his division before night, Sheridan only arrived at six o'clock. Gordon Granger took post at McAfee's church and remained there all day. Bragg's divisions were crossing the Chickamauga at all the fords and bridges and advancing steadily to the attack, which was generally met with great firmness. By night, however, the whole Union line was forced back to the Lafayette Road.

The ground was not unlike that of the Wilderness, hills with ragged woods, ravines, and a few cleared fields enclosed with rail fences. The terrain was unknown to the officers, no one could know much of what was going on except in his own immediate front. The fighting was as blind as in the Wilderness, and if anything more deadly. Battle lines advanced through the woods and fired on each other at close range till one or the other gave way. There were few skulkers and no organization refused to advance, or sought the rear, as did happen at the Wilderness. When night came one-fourth of the divisions engaged were killed or wounded. Several regiments lost fifty per cent of their strength.

The actual battle line extended from McDonald's House to a little below Viniard's. General Rosecrans' headquarters was at the Widow Glenn House. The supply trains were parked at Crawfish Springs, guarded by the Cavalry.

Crittenden's Corps was first on the field. This corps reached Ringgold Bridge on September 12 and was near Lee and Gordons Mill on the 18th. On that day sites were selected for the three division field hospital of the Corps, at a point on the Dry Valley Road a mile and a half north of Crawfish Springs.

This position was directly in rear of the corps at the time, but the battle began further north and continually shifted in that direction. About noon of the first day Medical Director Perrin ordered the hospitals moved farther to the left. The hospitals of the first and second division were packed up and moved to the direct rear of the firing line, presumably near the Widow Glenn House. Before night the medical director of the army ordered them moved back and they were returned to their original site.

It seems that the wounded were mostly brought off the field after nightfall. The first division hospital received four hundred,

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of which three hundred belonged to the division. This division was on the extreme right and nearest to Crawfish Springs.

The second division hospital reports receiving two hundred wounded and many more during the night.

The third division hospital received about five hundred wounded. They were from various divisions as will be easily understood. The ambulances of all the divisions worked till midnight and brought off practically all the wounded of the first day's battle except those within the enemy's lines. The total number of wounded on this day was estimated at 4,500.

In the first division of this corps a medical officer was placed in charge of the ambulance train of each brigade, thus improving on Letterman's arrangement and anticipating the present plan by forty years.

Thomas' Fourteenth Corps, after marching all night, reached the battlefield early on Saturday morning. Surgeon F. H. Gross, U. S. V., was medical director of this corps. Three divisions of the corps were placed in line on the left, in front of the Kelly Field. The second division, Negley's, was left near Crawfish Springs and later formed part of the right wing.

The hospital of the first division, Baird's, was established at the Dyer House; the best location occupied by any hospital on the field. The medical director says, "A fine spring, a number of outbuildings, and plenty of straw nearby rendered this a desirable locality for hospital purposes." When the division fell back to the line near the Kelly House, the hospital was in a reasonable distance, and it was on a safe road to McFarland's Gap.

The buildings were first filled with wounded, but by noon it was necessary to pitch tents.

About five o'clock a column of the enemy crossed the Lafayette Road and their shells fell in and around the hospital. The medical director ordered the wounded removed to Crawfish Springs, but the attack was quickly repulsed and the hospital remained where it was. The medical director of this division says, "We received more wounded from Brannan's division (3rd division, 14th Corps) than from our own, as it seems the ambulance drivers of that division were not informed as to the location of their division hospital." The hospital of Brannan's division was away out to the left at the Cloud House. Brannan's division was on the

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extreme left at the opening of the battle but shortly after noon was moved to the right of the Kelly Field, directly in front of this hospital. This was the best managed as well as the best located of all the hospitals.

The ambulances were kept moving all night and when the field had been cleared they were started evacuating the wounded to Chattanooga. About half were able to march, others were sent in returning supply wagons. By Sunday morning but forty wounded remained in this hospital. It may be presumed that they were non-transportable.

The hospital of the second division, 14th corps, was established near Crawfish Springs. The medical director of the division followed it to the field and thought the hospital should be established in its rear, i. e., near the Dyer House, but he was directed by Medical Director Perrin to go back to Crawfish Springs and establish his hospital there, which he did. His own judgment was better than that of his chief. He remained with the division, gathering the wounded and sending them to the hospital.

The hospital of the third division, Brannan's, was, by direction of General Thomas, established at the Cloud House. The medical director says, "There were good springs, a church, and several houses." The location of this hospital was not so bad as that of those near Crawfish Springs and would have been fairly good had the army been assured of victory. Many of the wounded, not only of Brannan's, but also of Baird's, Johnson's and other divisions were brought to this hospital.

By nightfall there were nearly a thousand; filling the church, houses, tents; and with hundreds more lying out of doors on the ground. As many of the more severely wounded as possible were dressed and fed with soup.

There was plenty of straw for bedding, but few blankets. Most of the wounded had thrown away or lost their own blankets during the battle.

The night was quite cold. In this hospital, as in others, the wounded were arranged in rows and great fires built at their feet.

The surgeons worked nearly all night, mostly in dressing wounds. Little operating was done. Operating out of doors by candlelight would naturally be avoided if possible.

The hospital of the fourth division of Thomas' corps was also at Crawfish Springs. When the army was driven from the field

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next day the Medical Director and many of his surgeons remained with the wounded and were captured. These surgeons were retained on the field by the Confederates to care for the wounded prisoners. Later they were taken to Atlanta and paroled. These events appear to have prevented the medical director from making any reports; at least none were made.

The Twentieth Corps, McCook's, did not reach the battlefield until the afternoon of the first day. This corps had a very limited hospital equipment. Before crossing the Tennessee River the medical equipment was ordered reduced to 500 pounds per regiment and was actually reduced to what could be carried on fourteen wagons, about five wagons to a division of 4,000 men. When the corps reached the battlfield one division (Johnson's) was placed on the left with Thomas, in front of the Kelly Field. The other two (Davis' and Sheridan's) were placed on the right, in front of the Widow Glenn house. The hospitals of these two divisions, first and third, were located near Crawfish Springs. The same objection holds against these hospitals as against all the others but with even greater force, since when McCook came on the field the lines were definitely formed and the battle was being waged three to four miles further north. The medical director of the first division says, "I twice selected locations for a division hospital and had to abandon them." He seems to have been in the rear of his division on the Lafayette Road and near the tanyard. He was directed to move his wounded to Crawfish Springs. He goes on to say, "With the exception of the medicine wagons, the regimental supplies were reduced by general orders (corps order) to 500 pounds to a regiment and this amount put with other baggage and taken with the regimental transportation. These supplies were not accessible when the battle came on and the medical officers had to rely on their knapsacks and such articles as they had in their ambulances. The wagon trains having been subsequently hurried to Chattanooga, the hospital supplies were only obtained when the troops reached that place. I sincerely hope such reduction will not be made again."

First the supplies were reduced to 500 pounds; next the regimental medical wagons were taken away and this 500 pounds loaded wherever it could be piled on a wagon; finally the wagons were sent off to Chattanooga. The corps was left with almost no

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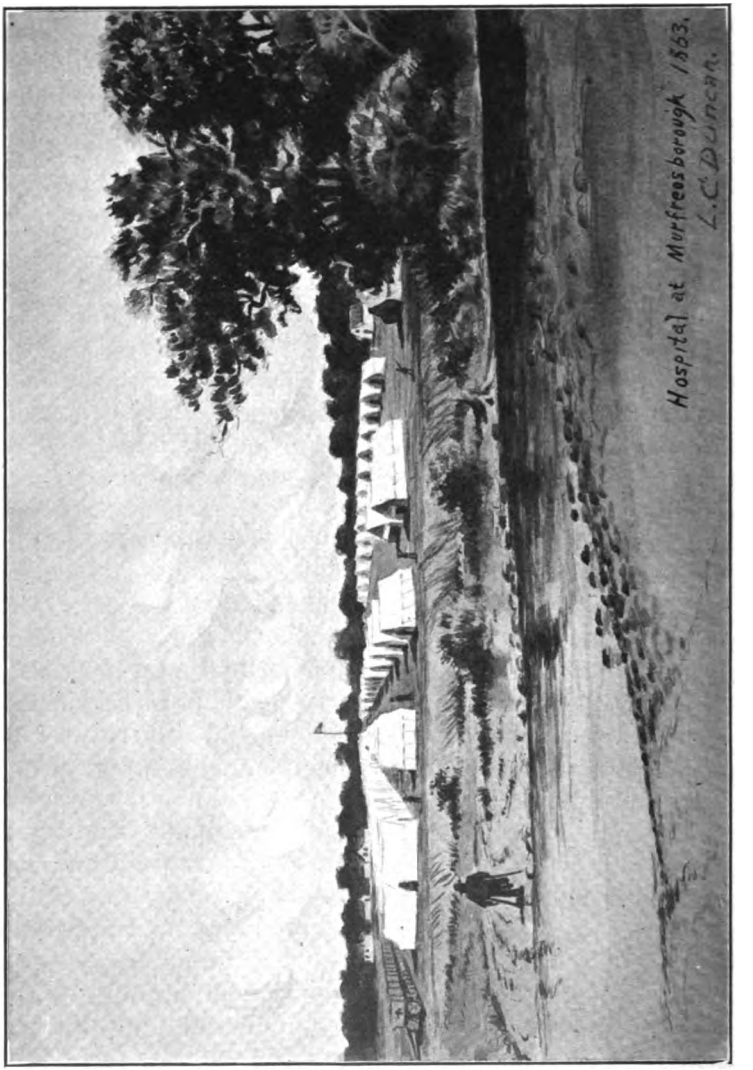

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medical supplies as anyone could have foreseen, yet such a reduction and just such a vicious method of transporting medical supplies is proposed in this year nineteen hundred and twelve.

The wounded of all hospitals near Crawfish Springs were badly commingled and the records were sadly incomplete. The food supply here was a grave question. The medical director quoted above says: "The supply of sanitary goods, beef extracts, tea, and, with five hundred pounds of fresh beef from the division commissary, and some sugar, coffee, and hard bread procured from the cavalry, enabled me to subsist the wounded until the afternoon of the 20th."

The hospital tents had been pitched and were left behind when the place was abandoned next day.

The history of the third division hospital is like that of the first. The medical director says that the wounded in the two days amounted to 1,500, of whom not more than 300 were treated in the hospital.

The second division, 20th Corps (Johnson's), on reaching the field at noon was sent to aid Thomas; the hospital followed and escaped the order to locate at the Springs. The Medical Director says: "I inquired of General Johnson about the propriety of establishing the hospital depot, in which he agreed after a halt a mile further on." The place first selected seems to have been well out towards Jay's Sawmill, and the hospital had to be drawn back to another site on the road. I am not able to locate this hospital with precision, but it must have been near the Cloud House.

This hospital had two medical supply wagons. The Medical Director organized the hospital and then went to the front to superintend the removal of the wounded, which was chiefly done at night. He says: "After three o'clock in the morning I went to the front the last time, with four ambulances, and removed all the wounded I could find. The work of dressing went on all night, but operations were left until morning." There was no light for operating, but the operations were never done, for when morning came other events transpired.

Darkness ended the first day's battle. The Army of Cumberland had been outnumbered and had suffered severely, but still maintained its lines covering the roads to Chattanooga. Though

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hammered mercilessly it was in better condition than after the first day's fight at Stones' River, and even from that wreck had been able to pluck victory.

The loss aggregated more than five thousand and the Medical Director estimated that there were four thousand five hundred wounded. About four thousand of them had been collected by midnight or shortly after. Work in most of the hospitals went on till morning. For the surgeons of Thomas' Corps who had marched all the night before this must have been especially trying.

SECOND DAY'S BATTLE.

During the night and early morning the Union lines were rectified. The left under Thomas was contracted and a line of breastworks thrown up. This line on the map shows the position of his troops on Sunday morning. The right wing extended from the south end of these works in a southwestern direction to the Widow Glenn House.

This new line was little more than two miles long but it still covered the vital roads. Granger still stood in front of Rossville Gap and the cavalry near Crawfish Springs. The hospitals remained as they were. This is to me inexplicable.

The general was entirely engrossed with a desperate battle. The Medical Director says nothing.

With the contracted lines the hospitals at Crawfish Springs were farther away than ever and in more danger. On the day before they were in the rear of the main line of battle; now they were in front and in great danger of being cut off at any time. The hospitals at the Cloud House were also in the same danger, in slightly less degree. The hospital at the Dyer House was too close to the firing line. That had been demonstrated the previous day and yet no change had been made. However, this hospital was the only one that had a passable location. That of the two on the left was bad; of the seven on the right it could hardly be worse. There were now five divisions on the left and five on the right (see map III). The hospitals on the left should have been northwest of the Snodgrass House within reach of the northern road to McFarland's Gap. Those of the right wing should have been on the Dry Valley Road, from the Vittetoe

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House west. Some from the center divisions could have been behind the Snodgrass House where there was shelter and a private road to the rear. A line from the Vittetoe House to the Snodgrass House and then north to the Brock House would give the general location of all the hospitals. Today they would all be behind Missionary Ridge.

On account of what looks like an unnecessary and faulty mixing up of divisions it would have been impossible to combine the divison hospitals; an excellent custom in the Army of the Potomac. Remember that these corps were smaller than our modern divisions and much less extended when in line of battle.

The second day's battle began about nine o'clock on Sunday morning with an attack on the left, which was kept up till noon, with no great success. However, the Confederate infantry and Forrest's cavalry crossed the Lafayette Road to the north of the line of works and the two field hospitals on this flank were soon cut off from the main line of the army.

On the right all was quiet until midday. Then, during a general shifting of divisions to send aid to the left, Longstreet burst out of the woods with an overpowering column, caught the right divisions moving in flank, and drove them in flight from the field. Davis', Sheridan's and parts of Negley's and Vancleave's divisions were driven in rout back along the Dry Valley Road to McFarland's Gap.

They rallied at the Gap but continued the retreat to Rossville and took no further part in the battle. Longstreet's forces pushed on for a mile behind the Vittetoe house but then turned to the north to assail Thomas. Wood and Brannan were thrown back at a right angle with Thomas' other divisions along the line of breastworks.

The whole remaining line of battle now made a horseshoe-shaped formation about Snodgrass Hill.

Here Thomas held out through the whole afternoon against almost the whole of the Confederate Army.

Once his extreme right, west of Snodgrass House, was all but turned, when Gordon Granger without orders marched two of his brigades to the sound of the guns and arrived in time to save Thomas from destruction. About five o'clock Thomas withdrew through the two gaps to Rossville, where he was joined by the

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other divisions and a new line of battle taken up. The Confederates, though victorious, were exhausted, and made no pursuit either that day or the next. On the twenty-second the army fell back to Chattanooga, acknowledging defeat.

When the second day's battle began the hospitals at Crawfish Springs were too far away to be of much use. But there was little or no fighting on the right before noon. At any time during the forenoon the hospitals might have been moved nearer the field and to safer positions. No one seems to have realized that they were as far from the field as was McFarland's Gap, a place of perfect safety. The fate of all these hospitals will be described, beginning on the left, where the battle of Sunday began.

The hospital at the Cloud house (3-14) was cut off early, certainly not later than ten o'clock. Most of the patients of the day before were removed. Sixty of the worst cases were left with most of the tents and supplies. The train of wounded that was started for Chattanooga reached there with the loss of but one ambulance, broken down on the road.

Medical officers were left with the wounded. This hospital was again in the Union lines for a short time in the afternoon when General Granger marched across from McAfee's Church, driving off Forrest's cavalry, but was finally lost that evening when the whole army returned to Rossville. So ends the story of this division hospital. The medical director reported soon afterward that a new outfit would be required before the division could take the field again. Yet he had done very well for his location, in saving his transportation and most of his wounded. The worst feature of the case was that this division had no field hospital during the remainder of the battle.

The next hospital in line was that of Johnston's division (2-20) also near the Cloud house. At this hospital the work had just begun on the second day when it was cut off like the other. The Medical Director had time to send all the wounded who could walk back to a hill in the rear and removed as many as possible of the others to the same place, by litters and ambulances. The irruption of the gray lines hastened the evacuation. The Medical Director collected his wounded and attempted to return to the hospital, but ran into the opposing lines and was made a prisoner. Granger's march also released him and his hospital

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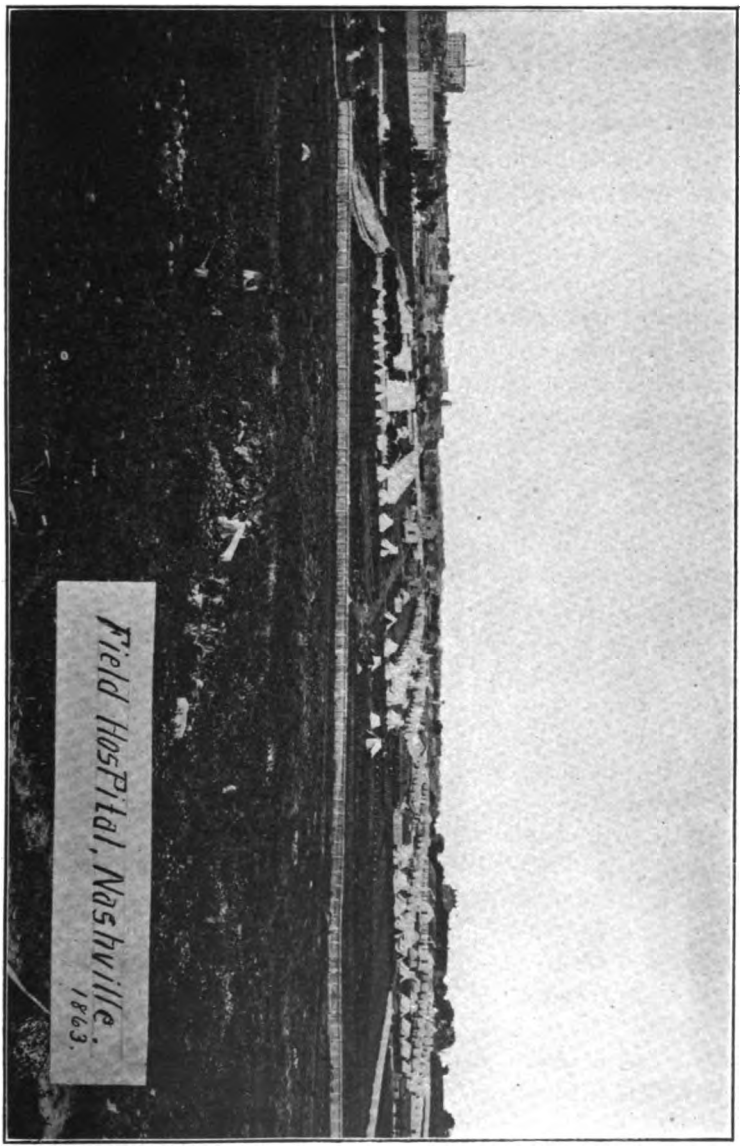

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temporarily. He resumed the removal of the wounded to the rear until evening when the Confederates took possession of the whole field and he again became prisoner. Next morning he escaped and made his way to Chattanooga. All the wounded had been gotten away except thirty. Four surgeons and a few men were purposely left behind with the wounded and to collect others. The camp and supplies were lost. The wounded on hand were brought off well, but this hospital, like the other, was of little use to its division on the most deadly day of the conflict. Both these hospitals were cut off before ten o'clock. Their position on the road to Rossville had allowed the removal of most of the wounded of the first day's battle; but for the great battle of the second day they were useless.

Let us see what happened on the right flank. The history of all the seven hospitals near Crawfish Springs was much the same. When Longstreet broke through the Union right at noon, all these hospitals were cut off from the army. Fortunately his victorious troops on passing the Vittetoe house turned to the right, and left the trains and hospitals unmolested for a time. They were safely guarded by the cavalry though separated from the main body of the army.

When it was known that the right wing was driven off the field the division surgeons consulted with each other and decided to abandon their hospitals. All wagons of every description, and ambulances, were loaded with all the wounded they could possibly carry; all that could march were sent on ahead and the whole caravan moved by a woods road back to Missionary Ridge and then to McFarland's Gap and Chattanooga. The cavalry covered the withdrawal of these wounded and trains very successfully. It appears that they might easily have been captured.

The tents as a rule were left, with a number of the more desperately wounded men. Medical officers, men, and supplies were left at each hospital. The hospital of the fourth division, 14th Corps (Reynolds), was captured entire with its officers. In the two division hospitals of the twentieth corps there were left two hundred and fifty wounded with eleven medical officers and 3,000 rations. The first division lost fourteen ambulances, the third lost one. It will be noted that more wounded were left in the more distant hospitals than in those on the left flank near Chat-

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tanooga. The records of all these hospitals were incomplete and in some all records were left behind.

All the division hospitals of the twenty-first corps (Crittenden) were abandoned by two o'clock with about two hundred wounded. Fourteen medical officers were detailed to remain with them. As these hospitals had cared for 1,200 wounded they seem to have done their work well until cut off. They were of no more use to the army, but their own corps had left the field.

The hopitals of the second division brought off nearly four hundred, leaving but forty behind. When the last ambulance left the enemy was within a few hundred yards of the hospital.

The third division brought off all their wounded except sixty, the first division left about one hundred.

We have now seen that by noon of the second day, or a little later, the two hospitals on the left flank and seven on the right had been entirely cut off from the army. But one remains, that of Brannan's division (3-14), near the Dyer house, the best located of all. It will be remembered that this hospital was kept clear.

When the attack began on Sunday morning shells fell about the place; by 10 o'clock it was in great danger and was at once evacuated. All the wounded except forty had been sent off during the night. These, with the tents and supplies, were loaded on the wagons and removed to Chattanooga. It was doubtless then thought that the whole battle was lost and the army in retreat.

This was the only division hospital brought off the field entire, due largely to its excellent location and in part to good management.

The army now had not a single available hospital left on the field, and the long desperate battle of the afternoon was yet to come. Map III shows the field at the time with all the hospitals out of reach. When the hospitals were abandoned at least half the medical officers and a considerable number of ambulances remained with the troops. Dressing stations were established and the wounded cared for as well as possible with almost no supplies.

THE RETREAT TO CHATTANOOGA.

When at five in the evening the field was finally abandoned some two thousand five hundred wounded were left to the enemy.

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Not more than five hundred of these were in the field hospitals; the remainder were in improvised dressing stations, but largely scattered over the field where they fell.

Night found the Army of the Cumberland beaten and sadly depleted but in some kind of a line of battle at Rossville, where it remained all of the next day before falling back to Chattanooga. It was estimated that not more than thirty-five thousand men could be placed in line at that place, so heavy had been the loss.

For the wounded every vehicle was taken and started to the rear; most of them reached Chattanooga Sunday night, but wounded men continued to come in during all of the next day and night. The ambulances were sent back as far as possible to pick up those who were dragging themselves along.

Those able to march did not stop long at Chattanooga, they were sent across the river and continued on their way to Bridgeport. Many of the severe ambulance cases were also sent to the rear. The grave cases were retained in Chattanooga. The general feeling as to the safety of the city at that time was one of serious doubt, and it was desirable to get the wounded to the rear as soon as possible.

The whole number of known wounded at Chickamauga was 9,749; of these about 7,500 reached Chattanooga. Every church, public building, and available house was filled. Many of the inhabitants had left their homes and these houses were seized for the wounded. There was a shortage of supplies at first, but probably no real suffering on that account till later. The medical supply train of the Fourteenth Corps had been brought to the field from Rossville on Sunday morning, but fortunately was turned back and reached Chattanooga in safety, where the supplies it afforded were extremely welcome. The reserve supply trains of the other corps also seem to have escaped but they had expended most of their supplies in equipping the field hospitals which were lost.

On the twenty-second a tent hospital of fifteen hundred beds was established at Stringers on the north side of the Tennessee River. Surgeon Moses, who, as previously stated, had been placed in charge of the hospitals at Chattanooga, says that about four thousand wounded were placed in extemporized hospitals in the city on the twentieth and twenty-first.

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Forty surgeons from the army were on duty in these hospitals, and four Confederate surgeons, attending prisoners.

All the severe cases were dressed the same night that they arrived or the next morning, and all received food, which they had not had for two days. This going without food, although much deplored at the time, was in many cases a great advantage. Not many operations were done on the field, very few in fact, as related by all the surgeons. This also was a blessing in disguise. On occupying the town two hundred bales of cotton were found; they were seized and made up into mattresses, and in ten days there was a mattress for every patient.

The exacuation of wounded began at once. The fear that Chattanooga would have to be abandoned and the growing scarcity of supplies rendered this measure imperative. The wounded were sent across the river, and over forty miles of rough mountain roads to Bridgeport, to their great detriment. Three thousand reached that point on foot, some of whom were malingerers. Within a few days steamers came up to Kelly's Ferry, ten miles below the city, and thereafter the wounded were sent by steamer from that point to the hospitals and trains at Bridgeport. The Confederates had advanced to within a few miles of Chattanooga and held the road leading back to Bridgeport on the south side of the river. By November twenty-fourth, one month later, the number of wounded in the general hospitals at Chattanooga had been reduced to four hundred and fifty.

A week after the battle General Rosecrans made arrangements to recover the wounded left on the field and the medical officers held as prisoners. Many had died and some had been sent south, but seventeen hundred and forty were recovered and brought into Chattanooga between September twenty-ninth and October second. Four medical officers were also returned. As the Union forces held but fifty wounded Confederates, those recovered were to be counted in future exchanges. This paroling of the wounded seems to have been an exceedingly advantageous thing for the Confederates, who had not the means for caring for their own wounded properly.

A glimpse of the wounded that were sent south is afforded by the report of Surgeon Joseph Jones of the Confederate Service,

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printed in one of the publications of the United States Sanitary Commission.

These wounded, with their fellow sufferers on the other side, were sent to improvised hospitals in Dalton, Rome, Kingston, Atlanta, Augusta, and other places in Georgia. Surgeon Jones says of the hospitals in Augusta:

"Upon my return to Augusta the Confeedrate hospitals were found crowded with wounded from the bloody field of Chickamauga. One thousand and fifty sick and wounded soldiers, about nine hundred of whom were recently wounded, were sent from the battlefield to Augusta. The majority of the wounds were slight and of the extremities. The battle was fought September 18-20th and the wounded were not received in Augusta until the 26-28, or from eight to ten days after the reception of the wounds. Not only were these soldiers much crowded in the cars and without proper dressing and attention to their wounds during the tedious journey of near three hundred miles, but many of them lay out in the depot with little or no attention to their wounds for from forty to eighty hours after arriving at Augusta. (These were Confederate wounded.)

"The hospital accommodations were wholly inadequate to the proper treatment of this number of wounded, and they were crowded into houses and churches the hygienic conditions and arrangements of which were defective.

"Thus the Second Georgia Hospital, with a capacity of 165, received 273. The Third Georgia Hospital, with a capacity of 130, received 221 (and so on). The capacity of the Presbyterian Church was only 112, nevertheless 240 wounded were crowded into it; the pews were not removed, the seats were converted into bunks and the wounded men laid in the pews. The capacity of the Catholic Church was only 50, yet it received 130 wounded.

"Hospital gangrene appeared first in the Presbyterian Church, a few days after the crowding of the wounded into it. Not a single wounded soldier escaped hospital gangrene in this building. The disease next appeared in the Catholic Church, and here also the wounded were all attacked. And finally the wounded of the Second and Third Georgia Hospitals were visited and a number of cases terminated fatally." This epidemic of gangrene doubt-

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less began in the dirty box cars that had been used in transporting wounded for months. It was probably spread by the attendants who went from patient to patient with the same sponge.

We have the report of Surgeon Moses that there were five cases of tetanus in the hospitals at Chattanooga, but neither erysipelas nor gangrene. This seems remarkable, but the better class of surgeons during the Civil War clearly understood that gangrene was violently contagious.

They isolated all cases and treated the disease with bromine and the strong mineral acids. Surgeon Jones believed "That hospital gangrene, smallpox, scarlatina, measles and similar diseases are communicated not only by actual contact, but also by the transmission of an effluvium from the original source of infection through the medium of the air."

Let us return to Chattanooga.

Bragg advanced to a position on Mission Ridge and Lookout Mountain and blockaded the city. Wheeler got in the rear and played havoc with the supply trains running back to Bridgeport. The Autumn rains came and the roads became all but impassable. Rations grew scarcer and scarcer. The troops were all put on half rations, and even those sometimes failed. Surgeon John Moore says that for several days corn in the ear was issued as bread rations.

Medical Director Perrin's report pictures the conditions at this time. "As the roads became more and more difficult by reason of the rains, only those subsistence stores that were absolutely essential could be brought up, and even those were soon reduced in quantity far below the standard ration. The country on the north side of the river had been gleaned of everything in the way of vegetables. Every effort was made to secure for the wounded enough food from the regular ration, including soft bread; but in the absence of vegetables and other delicacies they exhibited but too plainly the sad evidences of deficient nutrition. A want of fuel was also felt during the latter part of October and November. It was very discouraging to the medical attendants to witness the gradual but certain decline of patients who should have recovered, while they felt themselves powerless to apply the proper remedy."

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Toward the latter part of October about fifteen hundred sick and wounded were in the hospitals at Chattanooga. Starvation had reduced the animals to such a point that no ambulance transportation could be organized; there were not even horses for the guns. Things looked very dark when Grant arrived and reinforcements began to come in. Then the aspect changed. Hooker opened up the cracker line to Bridgeport, supplies were brought up in great quantities, and the wounded evacuated to the rear.

This line was opened on October twenty-eighth. The wounded were all sent north except some two hundred of the gravest cases, not suitable for transportation. The hospital across the river was broken up, more permanent hospitals established in Chattanooga, and preparations made for the next battle, which was now at hand. But that is another story.

The events of Chickamauga have been narrated; much more could be written, for the reports are unusually full and complete, more so than for any other of the great battles of the war. I hope that enough has been set down to give a tolerable idea of the various elements and phases of this great battle, as seen from the point of view of a medical officer.

LOSSES.

The losses at Chickamauga were, I believe, more severe in proportion to the numbers engaged than in any other of the great battles of the War. This battle is unique also in that the Confederate loss in killed and wounded was decidedly greater than that of the Union forces, being over sixteen thousand Confederates to less than twelve thousand Union. This was due to the facts that the Confederates had more troops on the field and that they were the attacking party, the other side fighting on the defensive, and largely under some kind of cover.

The loss in the infantry was one-fourth of those engaged. And there were no reserves held back as at Antietam; save for one brigade of Granger's Corps every brigade and regiment on the field was engaged, and the losses of many were remarkable. Steedman's reserve division in three hours lost 1,787 out of 3,900. The regular brigade of Baird's Division, fighting desperately on both days, lost seventy-five per cent of its strength in killed and

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wounded. Brannan's Division, fighting mostly without cover, lost 1,977 in killed and wounded and had but 214 missing. Many regiments lost half their strength. The Eighth Kansas, for example, lost fifty-five per cent in killed and wounded, practically all on the afternoon of the first day's fight.

The cavalry loss as usual was small; forty killed and one hundred and twenty wounded; total, one hundred and sixty, out of ten thousand present; or about one and six-tenths per cent.

The ratio of killed to wounded is given as one to six. This indicates that many reported as missing were either killed or mortally wounded, which was undoubtedly the case. The killed probably numbered over two thousand; the wounded amounted to nine thousand eight hundred. The total of killed and wounded in the two days at Chickamauga amounted to about four-fifths of the killed and wounded in the two days' battle in the Wilderness, where the infantry and artillery engaged were quite twice as numerous.

Most of the medical officers making reports commented on the slight nature of the wounds. This was partly due to the fact that the gravely wounded of necessity remained on the field. Yet the wounds as a whole were probably not so grave as in many other battles, for the reason that in the wilderness of Chickamauga the Confederates were not able to make much use of their artillery. In reading the memoirs of surgeons of the war one is continually impressed with the gravity of shell wounds. These were the wounds that baffled, even terrified the surgeon; the wounds from which he turned away in despair.

COMMENTS.

Before criticizing the work of the Medical Department in this campaign it is only just to consider the words of the Medical Director, Surgeon Grover Perrin, U. S. Army.

"When it is remembered that the Battle of Chickamauga was fought at a long distance from the base of supplies, in a region already gleaned of resources and difficult of access, that it was lost, and that the army was subsequently cooped up with but one outlet by a circuitous and difficult route of fifty miles in length, it may be safely asserted that the obstacles to be overcome in the

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successful care and treatment of the wounded were more formidable in this than in any other of the great battles of the war. An indulgent criticism may therefore be fairly claimed when viewing the results of treatment." He might have named other adverse conditions; the army was deep in the enemy's country; Nashville, the advance base, was one hundred and fifty miles to the rear, while the real base was on the Ohio River, three hundred and thirty-six miles away. This distance was traversed in the greater part by a single line of railway, every mile of which was at all times subject to sudden interruption by raids of Confederate cavalry. The worst factor of all was that the battle was lost.

Sudden evacuation of the field must always lead to confusion, with consequent suffering of the wounded. These facts should tend to leniency in condemning those responsible, they should not affect judgment as to faults.

Assistant Surgeon Samuel Hart, U. S. V., who was on duty with the regular brigade and had served in the Army of the Potomac, says in his report, "The hospitals had been established at inconvenient distances, particularly for the left wing. I am of the opinion that a less number of primary operations were performed than after any engagement I have ever witnessed; and that the facilities here are not equal to those of the Army of the Potomac for the prompt and efficient care of the wounded."

This criticism is eminently just, though the absence of operations was probably a blessing to the wounded.

The combination of regimental supplies and corps supplies was faulty; the combination of regimental hospitals to form brigade hospitals, and of those to form division hospitals, was more so. The ambulance organization was one of the best features of the medical service; and it had faults, as the lack of officers, and of a permanent enlisted personnel.

Excellent hospital railway trains were in use and temporary (evacuation) hospitals were organized along the railway as the army advance. It appears, however, that the personnel for these hospitals was mostly taken from the marching force, instead of being supplied from the rear as it should have been.

The peculiar geographical situation of Chattanooga and the roundabout route by which its only northern railway entered the

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city made it a very difficult place to supply or from which to evacuate wounded.

After the successful campaign for possession of the city the army should have halted there and spent some time in consolidating its conquest, in bringing up a reserve of supplies, refitting, and planning for the future, both front and rear. Rosecrans halted for months at Murfreesboro and Tullahoma, places of no importance, but did not delay a single day at Chattanooga.

The location of the hospitals was the glaring fault of the medical service in this battle. It was at first thought that Bragg would attack further up stream, near Lee and Gordon's Mills, consequently the hospitals were established at Crawfish Springs, not a very bad location, though the leaders seem to have not been accurately oriented. But when Bragg moved further down the stream the army drew farther and farther away from the hospitals. When the battle began seven out of ten of them were from three to five miles away, not to the rear but on the extreme right flank of the army. There was time for a change during the forenoon of the first day when there was but little fighting on the right, or during the night, or again during the forenoon of Sunday when the right wing was but little engaged.

The location of these hospitals was faulty for the following reasons:

I. Too many were grouped together, they should have been in at least two groups and near their respective corps.

II. They were too far from the line of battle for that period.

III. They were out on a flank, and on the most exposed flank. If on any flank they should have been on the left, toward the base, not on the right, toward the enemy.

IV. Every patient taken to Crawfish Springs had to be hauled on an average three miles to reach that point; then the same distance back on the way to Chattanooga; thus being moved a distance of six miles to no advantage, but often with much injury to his wounds. The idea of hauling wounded men six miles further than necessary during a great battle is an outrageous one. The time required to haul these patients to Crawfish Springs would have sufficed to remove them through McFarland's Gap, to a perfectly safe location, and one five miles nearer Chattanooga.

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The hospitals located at Crawfish Springs on the Eighteenth should have been moved during the battle. Those of the Twentieth Corps should never have been placed there at all. When this corps arrived on the field the lines of battle were drawn and the roads to the rear clear and plain.

Once located all the hospitals seem to have been fixed and immovable, though the battle drew farther and farther away and the danger of being cut off grew more and more grave. When they were finally cut off at noon of the second day all of the tentage and other material was of necessity abandoned. This was not so serious a thing, however, as the fact that these seven hospitals were of no use to the army on the second day. Had they been back toward McFarland's Gap, where they should have been, they could have been kept cleared or nearly so; then when the disaster came at least a part of them could have been saved. Some of them should have been in the rear of Snodgrass Hill, where they would have been available until the whole field was abandoned.

The hospitals on the left, near the Cloud House, were also badly located, though not so badly as those on the right. They were six miles nearer to Chattanooga and were protected to some extent by Gordon Granger's Reserve Corps. General Thomas, who seems to have acted with a large degree of independence, located these hospitals; or his medical director located them with his consent. When, on the night of the Nineteenth, Thomas took the position along the line of breastworks, these hospitals were left in an extension of that line. They should have been moved further back.

Owing to their location on a direct and short road to Chattanooga these hospitals were able to evacuate their wounded promptly, so that when they were abandoned very few were left behind. But they were out off by noon on Sunday and afforded practically no service to the army on the second day.

The last, and best located of all the hospitals, was another of Thomas' Corps, that of Baird's (First) Division. This hospital was admirably located for the first day's battle and was kept cleared of wounded. But when the lines were rearranged that night the hospital should have been moved further to the rear,

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somewhere behind the Vittetoe House. Warning had been given by shells falling around it the previous day. When the Confederate advance was made next day it was at once in danger, but owing to its good location and excellent management was able to escape entire in patients and material, the only hospital on the field that did so.

It should be said that the medical directors of Thomas' divisions knew that Crawfish Springs was an improper location for the hospitals.

Medical Director Marks of the First Division located his hospital at the Dyer House as just related. Medical Director Bogue of the Second Division says he was proceeding with the wagons and ambulances from Lee and Gordon's Mills toward the left, thinking the hospitals would be located there, when he was ordered to return to Crawfish Springs.

Medical Director Tollman of the Third Division located his hospital at the Cloud House. Medical Director Herrick of the Fourth Division, after his hospital had been located at the Springs, attempted to move it toward the left, but was prevented by the movement of troops and firing of the enemy. The independence of action and good judgment shown by General Thomas appear to have extended throughout his corps.

The fact that the army was practically without hospitals on the second day, while two-thirds of the troops remained on the field and more than half the casualties occurred, is the strongest indictment that can be made against the location of the field hospitals.

The evacuation of wounded from the three hospitals on the center and left appears to have begun early and to have been kept up, so that when these hospitals were abandoned not more than a hundred wounded remained in them. From the hospitals on the right the long distance to Chattanooga made the evacuation more difficult and it was not so well done; when these hospitals were abandoned several hundred wounded were left behind. At the present day some hospitals would be held in reserve at Rossville.

The care of the wounded after reaching Chattanooga was as good as could be expected under the adverse conditions prevailing at the time. Their prompt evacuation and the establishment

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of outdoor hospital in tents and arbors were excellent measures that doubtless saved lives that would otherwise have been lost in the blockade that followed.

MEDICAL OFFICERS, ARMY OF THE CUMBERLAND AT CHICKAMAUGA.

Medical Director of the Army,
Surgeon Glover Perrin, U. S. Army.
Assistant Medical Director,
Assistant Surgeon Dallas Bache, U. S. Army.
Medical Inspector,
Surgeon H. H. Seys, 15th Ohio Vols.
Medical Purveyor,
Surgeon Robert Fletcher, 1st Ohio Vols.
Medical Director, Fourteenth Army Corps,
Surgeon F. H. Gross, U. S. Vols.
First Division,
Surgeon S. Marks, 10th Wisconsin Vols.
Second Division,
Surgeon R. G. Bogue, 19th Illinois Vols.
Third Division,
Surgeon M. C. Tollman, 2nd Minnesota Vols.
Fourth Division,
Surgeon O. Q. Herrick, 34th Illinois Vols.
Medical Director, Twentieth Army Corps,
Surgeon Jabez Perkins, 10th Kentucky Vols.
First Division,
Surgeon L. D. Waterman, 39th Indiana Vols.
Second Division,
Surgeon Charles Schussler, 6th Indiana Vols.
Third Division,
Surgeon D. J. Griffiths, 2nd Kentucky Vols.
Medical Director, Twenty-first Army Corps,
Surgeon A. J. Phelps, U. S. Vols.
First Division,
Surgeon W. W. Blair, 58th Indiana Vols.
Second Division,
Surgeon S. G. Menzies, 1st Kentucky Vols.
Third Division,
Surgeon S. D. Turney, U. S. Vols.
Medical Director, Cavalry Corps,
Surgeon L. A. James, 4th Ohio Cavalry.

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NOTES ON LEPROSY IN THE PHILIPPINES.

By Passed Assistant Surgeon J. R HURLEY, U. S. P. H. S., Acting District Health Officer for the Island of Panay, P. I.

BY Act No. 1711 of the Philippine Commission, passed September 12, 1907, the Director of Health and his authorized agents are empowered to cause to be apprehended, isolated, or confined, all leprous persons in the Philippine Islands.

Under this law it becomes the duty of every insular, provincial or municipal official having police powers to cause to be arrested and conveyed to the nearest place of detention, for diagnosis, all suspect lepers.

The law provides that no person shall be permanently removed to Culion Island leper colony until the diagnosis of leprosy has been confirmed by bacteriological methods. It also provides that any person knowingly harboring, concealing, supporting, or assisting in the same, any person afflicted with leprosy, with the intent that such person be not discovered by the health authorities, is punishable by a fine on conviction of not more than $100.00 or imprisonment not to exceed six months, or both.

There is some doubt as to the exact time and manner in which leprosy was introduced into the Philippines. Some say it was brought in by the Chinese, either before or in the early days of the Spanish occupation. Another story goes that in the early part of the 17th century when the Jesuits were earnestly proselyting on the coast of Asia, every encouragement was given them by the government of the Philippines. Their activities extended to Japan, where any foreigner was "persona non grata" at that time. The Japanese thrust them out, but said: "You are so anxious for converts, we will send you a whole ship load of our people to Manila where you may convert them if you can."

When the ship arrived from Japan great preparations were made to receive the passengers. They were met at the dock by high dignitaries of both the Church and the State, accompanied by a great religious procession. Church bells were rung and can-

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non boomed. When, lo! to their great consternation and horror it was found that the ship was loaded with lepers. However, they put the best face upon the matter possible and conveyed the lepers to an isolated place on the outskirts of the city under the supervision of the Church, which they named San Lazaro. From that time to this the same site has been occupied as an isolation place for dangerous communicable diseases and still goes by the name of San Lazaro Hospital.

Aside from San Lazaro in Manila and another small lazaretto later established in Cebu under the auspices of the Roman Catholic Church, the Spaniards seem to have made no attempt to stay the ravages of the disease. The indigent, outcast lepers were allowed to travel the streets unmolested and eke out a miserable existence by begging, as is still the custom in China and Japan.

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As a result of this policy during the three hundred and fifty years of Spanish rule leprosy got a firm foothold in the islands and has caused the death of thousands of persons, practically wiping out whole families.

The mode of life of the Filipinos whereby half a dozen or more persons will eat, sleep and have their being in one small nipa shack; their manner of eating out of a common receptacle by dipping into it with their fingers; together with their endless religious fiestas, where great crowds mingle together for days at a time, eating, drinking and engaging in religious processions and exercises have, among other things, favored very much the spread of leprosy in these islands.

Lacking any known specific or remedy for leprosy so far, sanitarians are agreed that the only hope of stamping out the scourge lies in the rigorous and expensive measure of permanently isolating those afflicted with the disease, thereby removing in each leper a constantly acting focus of infection.

This has been provided for the Philippines in the leper isolation colony located on Culion Island. In this colony the lepers are for the most part better off than they were at home. The government feeds and clothes them, and when ill they are cared for in a modern concrete hospital by competent physicians, and nursed by the Sisters of Charity. Two priests reside on the island and maintain a chapel there for the benefit of the adherents of their faith among the colonists.

The lepers have their own little municipal government on Culion, and their own police force and band. Their relatives and friends are free to ship them creature comforts at government expense. Thus, many poor outcast lepers know for the first time in their lives what contentment and full stomachs mean.

There have been in the neighborhood of 5,000 lepers removed to Culion during the last five years; something over 2,000 lepers now being detained there.

It has been the duty and privilege of the writer during the past two and one-half years, while acting as District Health Officer for the three provinces on the Island of Panay, to collect and examine for deportation to Culion 275 lepers. These have been held in detention at Iloilo at various times till a sufficient number

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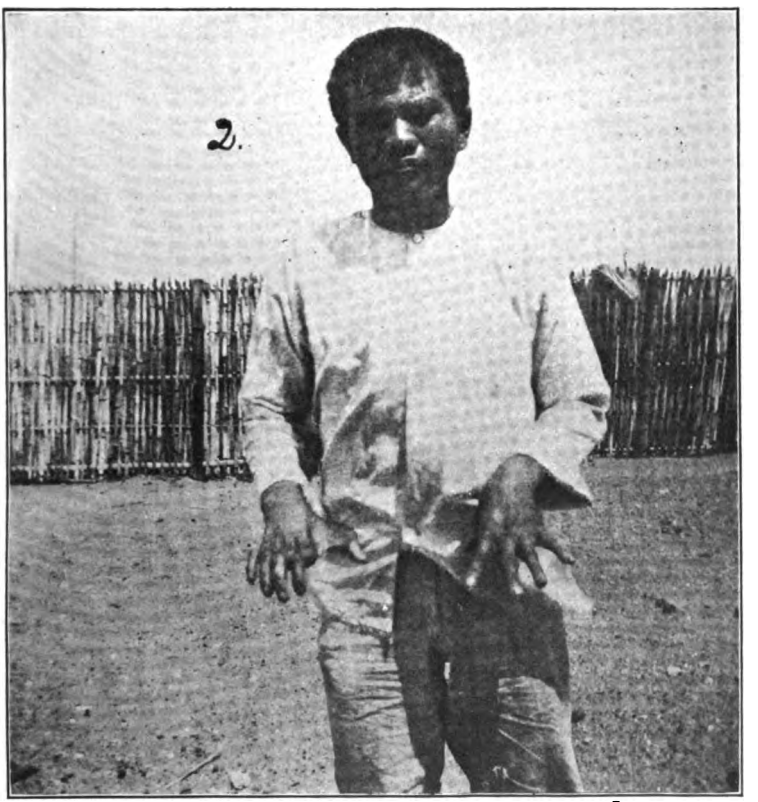
had accumulated to make it warrantable for the Bureau of Health to charter a special boat to convey them to Culion.

It is not the intention to discuss the symptoms and diagnosis of leprosy here. However, there are certain manifestations of the disease appearing in Filipinos, at least, which have been observed by the writer, that seem worth mentioning, not ordinarily being



given in the text-books. The classical description of the disease would be somewhat modified or altered as seen in the dark-skinned Filipinos, rendering the disease less easy to discern or diagnose clinically by the unaccustomed observer.

These manifestations are as follows: A reddish, sunburned appearance of the face and hands, and sometimes the skin of the back and other parts of the body. This is an early sign, and,

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aside from a possible ulcer in the nasal septum, or one or two inconspicuous nodules in the pinna of the ear, will be all there is to call attention to the disease. When seen it is practically pathognomonic as the dark-skinned natives never become sunburned.

Another manifestation, but only seen in advanced cases, is that the lobule of the ear will be seen to be both elongated and thinned. The lobule becomes no more than a fold of integument, so limber that it will flap in the wind, or can be made to flap by blowing upon it.

Obviously the pathological condition is that the round celled infiltration in the earlier stages, first hyperplastic, then atropic, has destroyed and replaced the normal areolar and adipose content of the lobule, leaving but a thin skin on a proliferated base of fibrous tissue.

Another feature which is only seen in old cases is a dry, shiny, somewhat scaly condition of the skin of the arms and back, either patchy, or in large areas, so that it takes on the appearance of old parchment. On picking up and lightly pinching a fold of this parchment skin it will be found noticeably thinned with loss of elasticity. The pinched-up fold remaining creased for some seconds or minutes. The pathology of this is probably similar to that in the flapping ears mentioned above.

The means of transmission or mode of spread of this disease has been the subject of speculation and experiment for a number of years. It is conceded that numerous factors play a part. Flies, bedbugs and other insects may aid in mechanically transferring the infection, though Currie,* working in Honolulu in 1910, has practically freed the mosquito from any indictment as a transmitting agent. By numerous experiments, allowing mosquitoes to bite leprous nodules and later crushing the insects and staining the material thus secured and examining it microscopically, he was unable at any time to demonstrate acid-fast bacilli in the stomach contents of mosquitoes that had fed on lepers' blood. He summarized his conclusions from these experiments as follows:

First. The reason that mosquitoes that have fed on lepers do not contain the lepra bacilli is that when these insects feed they

*P. A. Surgeon D. H. Currie, P. H. & M.-H. S., "Mosquitoes in Relation to the Transmission of Leprosy." Public Health Bulletin No. 39, September, 1910.

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insert their proboscis directly into a blood vessel and thus obtain bacilli-free blood, unmixed with lymph.

Second. That the above-mentioned habit alone accounts for the absence of lepra bacilli in mosquitoes that have fed on lepers; the insect neither avoids biting a leprous nodule nor is its digestive tract or the continued fluids capable of altering the morphology of this bacillus in a reasonable length of time.

However, it is commonly agreed that rather intimate contact for a greater or less length of time with a leprous person is requisite to incurring the infection.

It is certain that leprous mothers may bear healthy children, as the writer has observed a number of infants and young children under one or two years of age, still in the custody of their mothers, who presented no sign of leprosy either clinically or bacteriologically, though their mothers were manifestly leprous. This is not

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meant to say that these children would not at some later date develop leprosy, as they may have already incurred the infection the incubation of which is notoriously long and uncertain.

Several months ago Colonel Woodruff mentioned to the writer that an Army medical officer on duty in the Philippines had recently advanced the theory that fish in some manner might play a role in the development or spread of leprosy; it being noted at the time that the races most afflicted with this disease were Asiatics who subsisted to a large degree on fish, with large numbers of the population engaged in fishing and the handling of fish.

Dr. Woodruff and the writer examined and inquired into the histories of a number of lepers then in detention at Iloilo without finding anything definite in this regard for the few examined.

Recently the opportunity has presented to take more careful histories of forty lepers under detention at Iloilo. A summary of the facts elicited is as follows: All forty were Filipinos.

There were 27 males and 13 females.

By ages:—	
Under 10 years	2
Between 11 and 20 years	16
Between 21 and 30 years	9
Between 31 and 40 years	3
Between 41 and 50 years	2
Between 51 and 60 years	2
Over 60 years	6
Total	40

As to social state: Single, 19; married, 18; widow or widower, 3.

Length of duration of disease:—	
Less than 1 year	10
Between 1 and 2 years	6
Between 2 and 3 years	6
Between 3 and 4 years	1
Between 4 and 5 years	1
Between 5 and 10 years	9
Between 10 and 20 years	7
Total	40

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As to form or type of the disease:	
Tubercular	24
Anaesthetic	4
Mixed	12
Total	40
As to geographical location of home town:	
Coastal town	14
Inland town	26
Total	40

Only 2 of the 40 gave their occupation as fisherman. All the balance were either laborers, farmers, or housekeepers; with four women giving their occupation as weaver. A large number of women and girls in the Philippines engage in weaving jusi, piña, or cinamay cloth on crude looms at home.

Only one man gave a history of having been continuously engaged in the handling, curing or selling of fish.

Of the 40, only two gave a history of having had any relatives who were lepers. One man giving his age as 80, stated that he had had a son who was leprous, but that the son was now dead. The other, a boy, stated that his father died before he was born of a disease said to have been leprosy.

All denied having, or having had any leper friends. This, with some of their other statements, however, must be taken "cum grano salis," as the penchant for telling an untruth on many occasions, when the truth would do as well, or better, is a well-known trait of the Filipino character. Especially would it operate in this case, where the fear of being the cause of the discovery or apprehension of some of their friends would lead them to give a negative answer to the question in every instance.

They all denied having lived in the same house or room with leper friends, relatives or acquaintances. All but the one man who admitted having had a leprous son that died in Culion denied having any leprous relatives or friends in Culion. They all denied ever having had any sexual relations with leprous persons.

With regard to diet: all stated that their main articles of subsistence were fish, rice, with some corn and native vegetables and fruits in season.

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Of course 40 cases are too few from which to draw conclusions, but from the facts elicited there is nothing that points toward fish, or the handling of fish, as being a factor in the causation or spread of the disease in Filipinos.

The writer wishes to note the fact that in the Philippines, at least, where the Tao class,—among whom chiefly the lepers are found,—go barefooted the year round, it has been observed that

those with the nerve and mixed types of leprosy present in a large percentage of cases trophic ulcers of the foot. These ulcers constantly throw off a thin, sanious discharge teeming with lepra bacilli. Other natives following in their wake with cuts or abrasions on their feet very easily could, and undoubtedly do, thus pick up the infection. Children playing about on the floor could also pick up the infection in the same way. This is probably only

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one among many ways the infection is disseminated; but it seems likely that some of the infections could be accounted for by the above means.

In the annual report for the fiscal year 1910 of the Bureau of Health for the Philippine Islands it is stated that numerous remedies and treatments had been tried at Culion with negative re-

sults. Among which were the Nastin treatment, the mangrove decoction treatment, and others; but that the X-ray and the chaulmoogra oil treatments had given the most encouraging results, having caused the disappearance of all outward manifestations in a number of cases. It was also stated that hopes were entertained that a vaccine made from lepra bacilli grown in cultures outside the body after the manner of Clegg (in symbiosis

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with amoebae and the cholera organism) would prove of value in the treatment of leprosy in the future

The photographs give an idea of the appearance of leprosy in Filipinos.

No. 1 shows leonine countenance produced by tubercular leprous infiltration of superciliary ridges, cheeks and nose. Thickening and absorption of phalanges also shown.

No. 2 shows example of mixed type with infiltration of phalanges and contracture of hand.

No. 3 shows leprous nodules in superciliary ridges and ears.

Nos. 4 and 5 show advanced stage of leprosy with loss of phalanges and digits.

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A DIVISION FIELD LABORATORY—ITS POSSIBILITIES AS ILLUSTRATED BY EXPERIENCES WITH THE MANEUVER DIVISION.

By Lieutenant GEORGE B. FOSTER, Jr., Medical Corps, U. S. Army.

SHORTLY after the mobilization of troops at San Antonio, Texas, in March, 1911, the Chief Surgeon, Col. Henry P. Birmingham, Medical Corps, instructed the writer to assemble and set into operation a bacteriological laboratory, to aid the Sanitary Inspectors in the early detection of communicable diseases, should such diseases arise.

As far as I am able to learn, this laboratory was the first of its kind to be operated by the Medical Department of our army, or any other, under conditions closely approximating those of war, although I have recently learned that the Japanese are now conducting a similar laboratory at Tientsin, China, in conjunction with their sanitary work and that this laboratory is making examinations not only for the Japanese troops, but for the combined troops of the China Expedition.

In this era of scientific sanitary endeavor, it is surprising that the field laboratory has not been given more serious consideration by military sanitarians. State and governmental health boards have recognized the important part the laboratory plays in handling epidemic diseases and, at the present time, many health organizations investigate outbreaks of epidemic disease with portable laboratories, on the ground.

Our experience with the field laboratory in Texas convinced many of the medical officers with the Maneuver Division that the laboratory has a distinct sphere of usefulness in camp sanitation and, following the suggestion of certain of these officers, I will endeavor to describe the equipment of that laboratory and the work accomplished with it.

The apparatus and supplies comprising the equipment were obtained by purchase, emergency requisition, and, through the courtesy of Major F. F. Russell, from the Laboratory of the Surgeon

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General's Office at Washington. An outfit containing the articles required for the bacteriological and chemical examination of water (par. 873, M. M. D., 1911), was obtained from the Washington laboratory and the remaining chests and crates were improvised upon plans submitted to the Medical Supply Officer, Maneuver Diviison. The entire equipment, packed and ready for transportation, weighed 550 pounds and occupied one-third of the space available in an escort wagon.

The articles comprising the equipment are enumerated below:

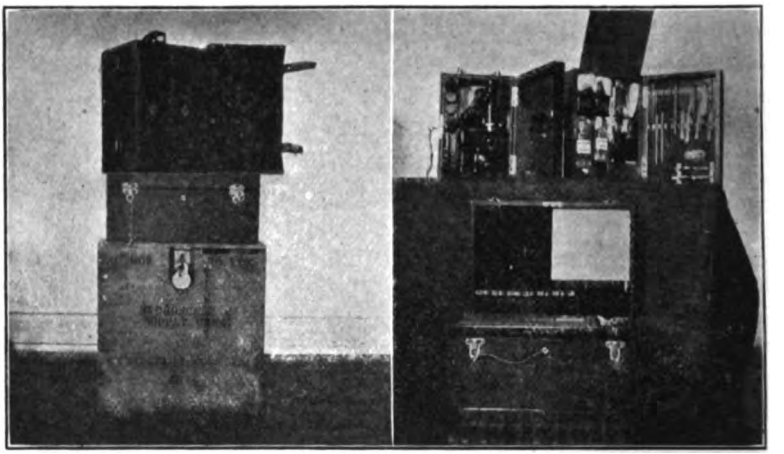

FIGURE 1.—Microscopical Outfit, Field. Picture to the left shows the box in which the outfit is packed. On the box are the microscopical supply case, leather case holding folding microscope, and accessory case to folding microscope. Picture to the right shows contents of cases.

FIELD LABORATORY OUTFIT.

(In five chests and three crates.)

Chest No. 1.

Microscopical Outfit, Field (par. 897, a, b, c., M. M. D., 1911.)

Chest No. 2.

Outfit for Field Laboratory (par. 873, M. M. D., "Chest No. 2.")

Additional articles, as follows:

Blood lancet, Leutenschlager----------no. 2

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Brushes, camel's hair, small	no.	2
Burette, Mohr, 25 c.c.	no.	1
Fuchsin, basic, sat. alc. sol., in 60 cc. bott.	botts.	1
Gelatin, white, in 1-lb. pkgs.	pkgs.	1
Haemocytometer, Thoma-Zeiss, complete	no.	1
Litmus, purified, Merck, in 3-oz. tin	tins	1
Maltose, c. p., in 3-oz. tins	tins	1
Mannite, c. p., in 3-oz. tins	tins	1
Phenolphthalein, .5% sol., in 50% alc., in 30 cc., dropping bottle	botts.	1
Saccharose, c. p., in 3-oz. tins	tins	1
Sodium hydrate, sticks, c. p., in ½-lb botts.	botts.	1
Sodium hydrate, N/1 sol., in 120 cc., botts.	botts.	1
Sodium hydrate, N/20 sol., in 120 cc., botts.	botts.	1
Sodium sulphite, crystals, in 1-lb botts.	botts.	1
Stirring rods, glass	no.	2
Syringe, Luer type, of glass, 10 cc	no.	2
Syringe, Sub-Q, with needles, 1 cc.	no.	2
Thermometer, 200°C., for sterilizer	no.	1
Wright's capsules, for blood specimens	gross	1

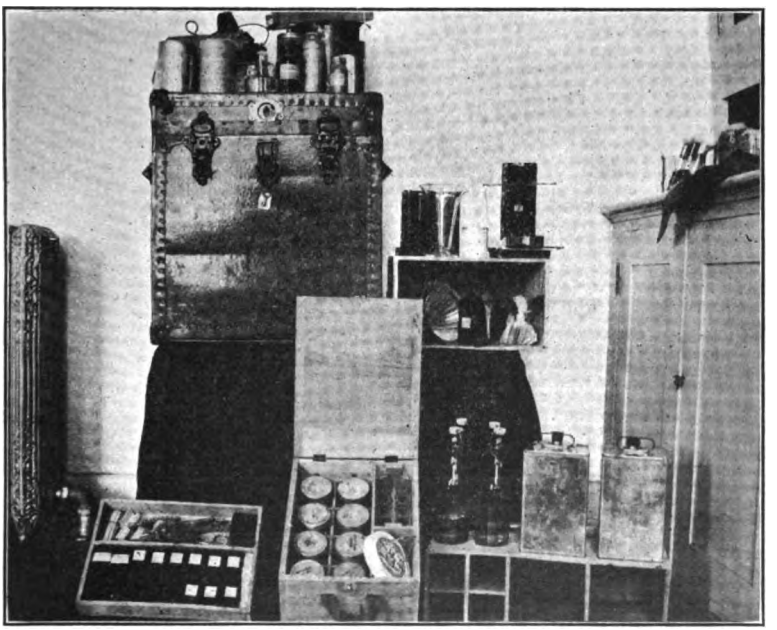

FIGURE 2.—Chest No. 2. Compartments are shown in the lower part of the picture and to the right of the chest.

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Chest No. 3.

Outfit for Field Laboratory (par. 873, M. M. D., "Chest No. 1.")

Additional articles, as follows:

Mason jars, glass, with screw tops, 1-pint, for the following fluid culture media	no.	9
Bile medium, Coleman and Buxton	jars	2
Broth, plain	jars	1
Glucose-broth	jars	2
Lactose-bile	jars	1
Litmus milk	jars	1
Peptone-water, Dunham	jars	1
Salt solution, physiological	jars	1
Rubber rings, for Mason jars, in pkgs. of 12	pkgs.	3

Chest No. 4.

Erlenmeyer flasks, 500 cc., for solid media	no.	7
Test tubes, with tubed media as follows	gross	1
Agar slants	tubes	30
Double sugar medium, Russell	tubes	30
Litmus-glucose-agar	tubes	30
Litmus-maltose-agar	tubes	30
Litmus-mannite-agar	tubes	30
Litmus-lactose-agar	tubes	30
Litmus-saccharose-agar	tubes	30
Loffler's blood serum	tubes	30

Chest No. 5.

Bacteriology, text-book of, Hiss & Zinsser	copies	1
Bottles, n.m., g.s., 250 cc., sterile	no.	6
Cover glasses, square, 18 mm., No. 2	oz.	2
Cultures on agar of B. typhosus, B. para-typhosus, and B. dysenteriae—Shiga, Flexner, and Y	of each no.	1
Drop culture slides	no.	12
Elbow rod, for plating feces	no.	12
Erlenmeyer flasks, 250 cc.	no.	6
Fehling's solution, 1 and 2, in 8-oz. botts.	botts.	2
Fuchsin, basic, Grubler	botts.	1
Glass slides, 1x3 inches	gross	2
Petri dishes, diam. 15 cm., for plating feces	no.	24
Pipettes, graduated, 1 cc.	no.	24
Pipettes, graduated, 10 cc.	no.	6
Pipette box, of iron, for sterilizing pipettes	no.	1
Stain bottles, Barnes, 30 cc.	no.	6

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Tubes, glass, 6x15 mm., for fermentation tubes	gross	1
Vaseline, in 1-oz. jars	jars	1
Vials, glass, with stoppers, 5 cc., sterile	gross	1

Crate No. 1.

Outfit for Field Laboratory (par. 873, M. M. D. "Crate No. 3.")

Crate No. 2.

Sterilizers, hot air, B. & L., 48x30x24 cm., inside.

Crate No. 3.

Stove, Dangler, with double oil burner.

Accessories—Not Crated.

Folding tables	no.	2
Buckets, galvanized iron	no.	4
Tent, hospital, complete	no.	4

The method of packing the above equipment is shown graphically in the various illustrations accompanying this paper.

The laboratory outfit was set into operation first at the Post Hospital, Fort Sam Houston, where a room was obtained through the courtesy of the Surgeon, Lieut. Col. Allen M. Smith, Medical Corps. Here, the laboratory served as a clinical laboratory for the Base Hospital and operated for the Maneuver Division as well. The conditions under which the laboratory was operated at the Base Hospital are comparable to those under which it would work in a Base Hospital or mobilization camp in time of war, in investigating an outbreak of epidemic disease at a locality distant from one of the Army General Laboratories, or, in short, at any place that its services might be required where room in a building was available.

The conditions under which the laboratory would be operated in the field, where a building was not available and the work would have to be done in a tent, were encountered by transporting the equipment to Leon Springs, Texas, where it was operated for a week. The conditions there were similar to those that might be expected in semi-permanent camps such as a summer maneuver camp or camp of instruction.

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The trial at Leon Springs was ordered by the Chief Surgeon, and its object was to demonstrate whether or not the equipment was transportable by wagon over rough roads and to actually operate the laboratory under service conditions. The equipment was carried by an escort wagon which accompanied a Field Hospital en route to, and from, Leon Springs. On these two marches

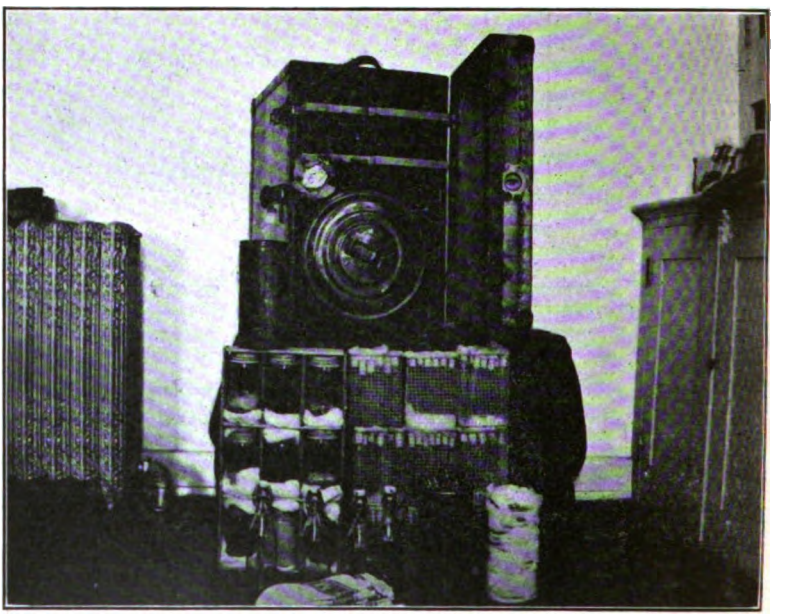

FIGURE 8.—Chest No. 8. The compartment to the left (upper in picture as chest is on end) holds a crate with 9 Mason jars for fluid media. The middle compartment holds 9 wire baskets of sterile tubes for culture media. The large compartment holds an Arnold sterilizer, shown in situ. Remaining articles are packed in the sterilizer.

the laboratory was transported over approximately 50 miles of rough roads, in a wagon without springs, and the only breakage incurred was one Erlenmeyer flask.

The entire equipment was unpacked and assembled in a hospital tent, by the medical officer in charge and one sergeant of the Hospital Corps, within three hours after its arrival in camp. While the necessary glassware and media were being sterilized, samples of water were collected from three of the several sources of supply. A report on these samples—including qualitative chemical tests for nitrites, nitrates, and chlorine; determination of the

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number of bacteria per c.c.; and a presumptive test for the presence of B. coli—were made to the Chief Surgeon within 24 hours. These preliminary reports were supplemented by confirmatory reports in 48 hours.

In addition to water analyses, clinical laboratory examinations were made in the instance of patients admitted to the Field Hospitals, when indicated. These procedures included blood cultures, bacteriological examinations of feces in suspected typhoid and dysentery cases, microscopical examinations of stools for parasites and ova, routine blood examinations, and the examination of throat cultures, sputum, and miscellaneous smears. The results were uniformly satisfactory.

The apparatus worked perfectly. Sufficient heat for sterilization was quickly generated and maintained with the Dangler stove in both steam and hot-air sterilizers. The temperature in the incubator never fluctuated more than a degree in 24 hours and this was remarkable in view of the marked atmospheric fluctuations in that country between noon and midnight. The only water obtainable was so alkaline that it could not be used for the preparation of culture media and this feature would have caused great annoyance had it not been anticipated by carrying distilled water and sufficient culture media as part of the equipment.

The laboratory endeavored to act as a watch dog of the sanitary situation at all times. Whenever the laboratory examinations showed a patient in either the Base Hospital or Field Hospitals to be suffering with a communicable infection, a memorandum to that effect embodying data as to the probable source of infection as suggested by the patient's history, contact with other soldiers, etc., was sent immediately, by messenger, to the Chief Sanitary Inspector. This procedure enabled the sanitary authorities to cope with the preventive aspect of the situation without loss of time.

One thousand and forty examinations were made during the four months the Maneuver Division Laboratory was in operation. The scope of these examinations is shown in the following table:

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LABORATORY EXAMINATIONS.

Typhoid examinations—		
Cases of typhoid fever		2
Convalescents		2
Suspects for diagnosis		30
Suspected carriers		9
Agglutination tests (Widal)		10
Positive	4	
Negative	6	
Blood cultures		33
Positive	2	
Negative	31	
Feces examinations		25
Positive	3	
Negative	22	
Urine examinations		10
Positive	0	
Negative	10	
Dysentery (bacillary)—		
Agglutination tests		4
Positive (Flexner type)	1	
Negative	3	
Feces examinations		6
Positive (Flexner type)	1	
Negative	5	
Blood examinations		148
Leucocyte counts	34	
Differential counts	21	
Hemoglobin estimations	5	
For malaria	88	
Feces examinations		165
For parasites and ova	159	
Bacteriological	6	
Sputum examinations		229
Urine examinations		346
Miscellaneous cultures		14
Miscellaneous smears		33
Water examinations		10
Chemical	4	
Bacteriological	6	
Autogenous vaccines prepared		2
Autopsies		5
Total		1,040

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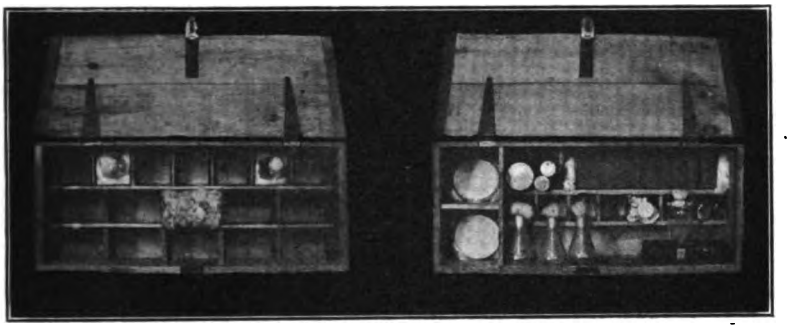

FIGURE 4.—Chest No. 4, used to transport solid culture media.
FIGURE 5.—Chest No. 5, for miscellaneous equipment.

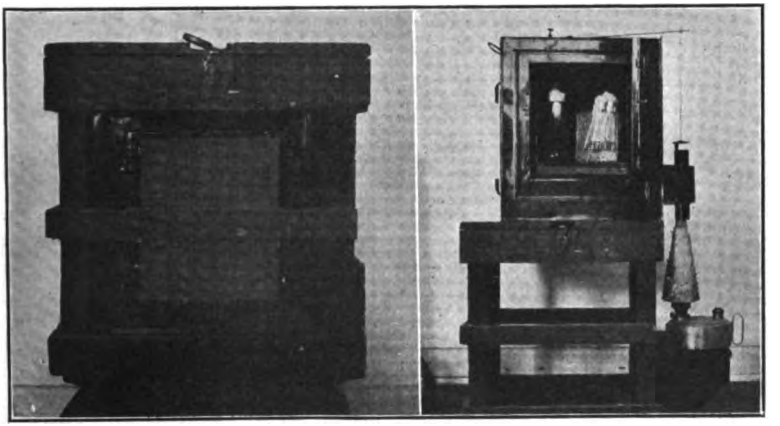

FIGURE 6.—Field incubator. Crated and ready for transportation in picture to the left. In operation in picture to the right.

TYPHOID FEVER.

Blood cultures were made in all cases of fever of over 48 hours' duration in which the diagnosis was not certain. B. typhosus was isolated in pure culture from two cases. Blood cultures were uniformly made by inoculating two flasks of broth and three tubes of bile medium with 10 c.c., of blood, taken from a vein. The use of tr. iodin to antisepticize the skin gave excellent results and no contamination with skin organisms occurred.

Feces examinations were positive in two cases in which the bacillus was isolated from the blood. One examination was posi-

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tive during convalescence and, in this case, three negative examinations at 10-day intervals were made before the soldier was returned to duty. The feces and urine of nine civilian employees attached to the 18th U. S. Infantry were examined to detect a possible "carrier," with negative results.

Comparatively few agglutination tests were made, as practically all patients in whose cases this diagnostic procedure was indicated had been vaccinated against typhoid. Antityphoid inoculations stimulates the production of specific agglutinins and the use of the agglutination test in diagnosis is obviated in those cases in which the prophylactic has been administered.

But two cases of typhoid fever occurred in the entire Maneuver Division during four months. One of these cases had not received the prophylactic and the other received but two of the three inoculations prescribed. The latter case exhibited a very mild type of fever and undoubtedly would have been overlooked had the diagnosis not been made bacteriologically. The diagnosis was made by blood culture on the sixteenth day of the disease and the patient was out of bed and sitting up at the time. Subsequently, B. typhosus was isolated upon two different occasions from the feces in this case.

Although the sanitary conditions in camp were of the highest order, exposure of the troops to typhoid infection must have been frequent during their visits to town, as the vital statistics show that typhoid at the time was, and always is, prevalent in San Antonio. It may reasonably be assumed, in view of the bacteriological examinations made in all cases of fever of undetermined type, that no mild cases of typhoid went undiagnosed. Submitting that probable exposure to typhoid did occur in a certain percentage of the troops and that no mild cases escaped detection, the remarkably low typhoid morbidity must be attributed, in great part, to the protection conferred by typhoid prophylaxis.

MALARIA.

Eighty-eight (88) blood examinations were made for malaria. The findings were positive in 11 cases, in each of which the benign tertian parasite was demonstrated. No cases of quartan or

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estivo-autumnal malaria were encountered. In one instance "place infection" was certain and in another instance probable.

DYSENTERY.

One case of bacillary dysentery and eight cases of amebic dysentery were detected. The organism isolated from the bacillary case agglutinated with the patient's serum in a dilution of 1-160 and answered the cultural and fermentative requirements of B. dysenteriae, Flexner type, Harris-Wollstein strain.

Seven of the eight amebic cases were due to entameba histolyica, while amebae detected in the stools of the remaining case morphologically answered the description of entameba tetragena. Two of these cases of amebic dysentery were recurrent attacks of infections which were originally contracted in the Philippine Islands, one case was of doubtful origin, and the remaining five cases were undoubtedly contracted in San Antonio. Each of the

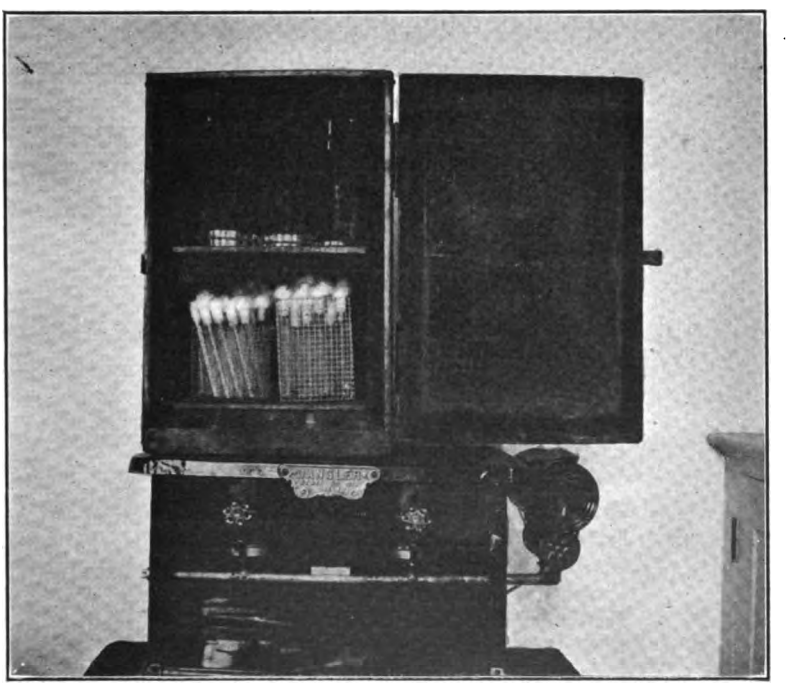

FIGURE 7.—Dangler stove and hot air sterilizer.

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five original infections was investigated most carefully as to its origin and infection by means of contaminated food or water was satisfactorily eliminated. Contact infection could not be demonstrated definitely, but, in each case all the evidence pointed to contact as the probable source of infection.

A native boy, 16 years of age, who had never been outside San Antonio, came to the Base Hospital complaining of chronic "bowel trouble." He was undersized, extremely anemic, much emaciated, and presented the classical picture of uncinariasis. Examination of his feces revealed not only the presence of necator americana, but numerous entamebae histolyticae. Thymol was administered and subsequent examinations failed to show the presence of hook-worm, but the amebae still persisted. This case evidences the fact that infection with the amebae of tropical dysentery occurs in that section of the United States.

The amebae observed in the stools of all the above cases were larger than E. Coli; exhibited actively ameboid progressive motion; were vacuolated; showed sharply differentiated endosarc and ectosarc; and showed englobulated red cells. Amebae were never pronounced of the histolytica type in the absence of englobulated red cells. All the cases in which these amebae were demonstrated had clinical dysentery and two of them developed liver abscess.

INTESTINAL PARASITES.

One hundred and sixty-five (165) examinations of feces for parasites and ova were made, of which 77 were positive. The findings are enumerated below:

Necator americana (hook-worm)	26
Cercomonas hominis	13
Entameba histolytica	13
Entameba coli	8
Entameba tetragena	1
Ascaris lumbricoides	8
Taenia saginata	3
Taenia hymenolepis nana	1
Strongyloides stercoralis	2
Tricocephalus dispar	1

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Through the courtesy of Lieut. George B. Jones, Medical Reserve Corps, the feces of all the southern-born recruits of the 10th U. S. Infantry were examined for parasites and ova. A similar investigation was carried on at the same time in the instance of all patients of southern birth admitted to the Base Hospital. The 55 cases examined were not selected ones, but were taken routinely as they came in. The findings, therefore, although the number of cases is small, give a fair index of the incidence of infestation with intestinal parasties in soldiers of southern birth, especially as regards hook-worm infection. The results are tabulated below:

Incidence of Helminthiasis in Southern Soldiers.

Nativity.	Hook-worm	Ascaris	E. coli	Cercomonas	Strongyloides	T. saginata	Total examined	Number positive	Number negative
Kentucky	6	2	1	2			19	11	8
Tennessee	5	3	1				12	9	3
Virginia	2				1		6	3	3
Mississippi	1						1	1	0
Florida	1						2	1	1
Georgia	1						4	1	3
Delaware	1					1	3	2	1
North Carolina	1						6	1	5
South Carolina							1	0	1
Alabama							1	0	1
Totals	18	5	2	2	1	1	55	29	8

By reference to the above table it will be observed that 33% were infested with hook-worm, 9 1-11% with round-worm, and 10 10-11% with other parasites—a total of 53%.

As the majority of these soldiers exhibited no clinical manifestations of uncinariasis or of other forms of helminthiasis, the findings demonstrate the analogy between these individuals and the typhoid "carrier" as sanitary considerations. They also emphasize adherence to the principle that "all excreta should be looked upon as potentially infective," and that the results obtained by typhoid prophylaxis should not give us a false sense of security which would lead to "letting up" in the matter of camp sanitation.

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CONCLUSIONS.

Paragraph 560, M.M.D., 1911, provides for "field laboratories," in campaign, as a part of the Medical Department of the Line of Communications; paragraph 686(f) authorizes the Chief Surgeon to establish such laboratories; paragraph 732 outlines the functions of the field laboratory; and paragraph 788 provides for the rendition of necessary reports, records, and returns. The only equipment provided for by the Manual, however, is the Microscopical Outfit, Field (par. 897) and the Outfit for Field

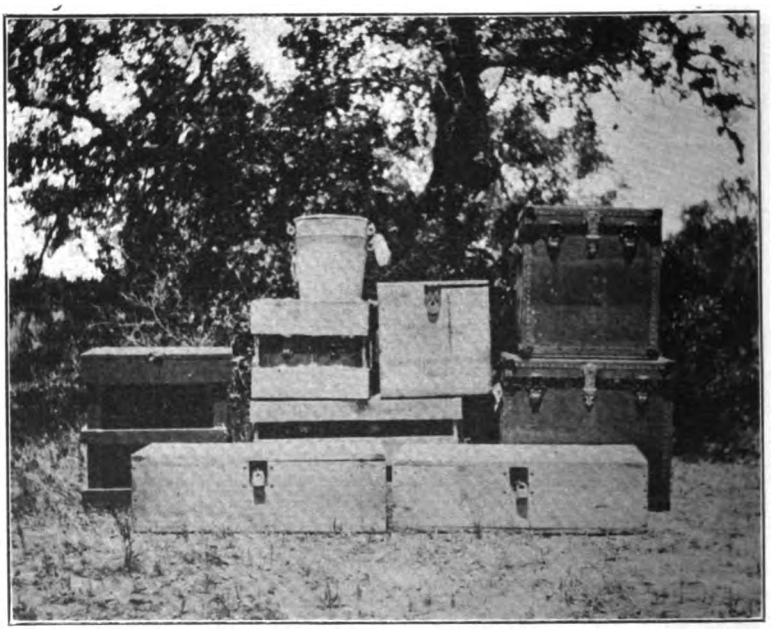

FIGURE 8.—Field Laboratory packed and ready for transportation. Weight 550 pounds.

Laboratory (par. 873). This equipment proved inadequate for the work required of a field laboratory at San Antonio, and, on the other hand, contained many unnecessary articles.

It was impossible to assemble a model field equipment at San Antonio because of the lack of funds and facilities; because of the necessity of preparing hurriedly for an emergency which, at the time, seemed imminent; and because there were no precedents to follow, as this laboratory was the first of its kind. I believe,

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however, that the crude equipment, outlined in the first part of this paper, is better suited to the work required of a field laboratory than is the equipment provided for by the Manual of the Medical Department; although it, in turn, could be greatly improved along the following lines.

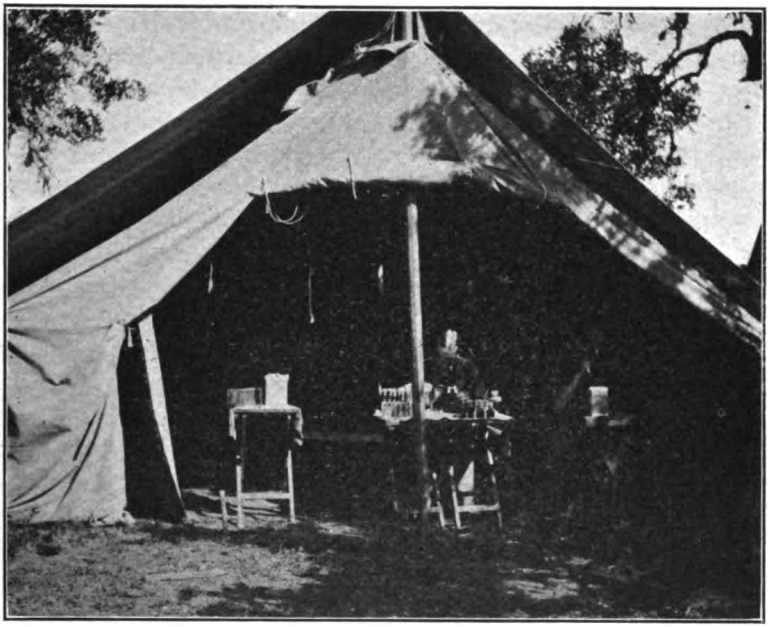

FIGURE 9.—Field Laboratory in operation at Leon Springs, Texas, June, 1911.

To facilitate transportation, avoid breakage, and reduce weight and bulk to a minimum, chemicals should be put up in narrow mouth, glass-stoppered bottles which, in turn, should be protected by tin containers. Special chests should be constructed in which to pack the equipment. These should be strong, iron bound, with hinged lids and hasps, locked with padlocks, and as nearly uniform in length and width as conformation of the contents permit. Each chest should contain trays so partitioned that the tin containers and various pieces of apparatus fit snugly, thus obviating the use of cotton, excelsior, or other packing.

The Microscopical Outfit, Field (par. 897) contains many articles which were duplicated in the other chests and only a

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portion of its contents formed a real part of the equipment. The folding microscope (a) was found to be eminently practicable and suited to work in the field. The accessory case to microscope (b) was less satisfactory. The stains were uniformly worthless and I have found this to be the rule as regards stains prepared by optical houses. Barnes dropping bottles, with grooved neck and stoppers, in screw-top tin containers, could replace with advantage the bottles containing stains. The microscopical supply case (c) could be dispensed with entirely.

In conclusion it may be stated that the field laboratory is not only practicable, but in this era of scientific sanitary endeavor, a necessity. Several of these units should be assembled and at least one kept at each General Laboratory. In the event of an outbreak of epidemic disease, one of these units could be shipped to scene of the epidemic and the situation investigated and handled on the ground.

The usefulness of the laboratory in the early diagnosis of infectious diseases and as a check upon the sanitation, in semi-permanent and permanent camps, was exemplified in the Maneuver Division Camp and it is hoped that the laboratory experiences there will pave the way for the organization of the field laboratory as an essential part of our armamentarium.

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POISONING FROM BACILLUS ENTERITIDIS.*

By Medical Director FRANK ANDERSON, U. S. N.

ON the occasion of the launching of the collier Prometheus at the Mare Island yard on December 5, 1908, a collation was served to the invited guests by the citizens of Vallejo. A cold lunch for twenty-five hundred people was provided. This was furnished by a well-known caterer of San Francisco who brought everything up from the city to Mare Island on the day previous to the launching. The provisions were stored over night in government buildings under a marine guard to insure their safety. The lunch consisted of cold chicken, ham, tongue, beef and cheese sandwiches, shrimp salad, cake, etc. It was well served, clean, and had the appearance of being wholesome in every respect and was accordingly very freely partaken of by the invited guests. After the guests had departed such food as remained, consisting mostly of beef sandwiches, was sent to an orphan asylum near Vallejo and distributed among some individual families.

About fifteen hours after the lunch, cases of what appeared to be gastro-enteritis began to develop among those who had eaten of it. The first case that came under my own observation was that of an officer who was seriously ill from the outset of his attack. His illness commenced with diarrhoea; soon afterward there was a chill followed by vomiting. The nausea was very distressing. Severe abdominal cramps and pain in the lumbar region soon followed and continued for twelve hours. The temperature rose to 104° and his prostration was extreme. This patient was quite ill for about one week, the symptoms, however, after the first forty-eight hours showing some amelioration. It was nearly three weeks before he completely recovered his strength and was able to return to duty. This was a fair type of the more severe non-fatal cases.

From the morning of December 6, reports of similar cases kept coming in from every direction. The symptoms were usually the same, varying only in intensity and as a rule the

*Read by title at the 20th Annual Meeting.

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earlier the illness developed the more severe the attack proved to be. In some instances there were relapses but the great majority of cases after ten or twelve hours of vomiting and diarrhoea went on to complete recovery and at the end of two or three days were well. Most of the cases reported occurred within thirty-six hours of the lunch but some were as late as one week in developing. It is estimated that in all about one thousand cases occurred; of these only two were fatal. One of these fatal cases was a waiter who had helped to prepare the lunch and who had eaten freely while doing so. The other was a woman to whom some of the left-over sandwiches had been sent. Both of the victims were physically below par at the time of attack. The man was tuberculous, the woman in poor health and in the sixth month of pregnancy.

On account of the extensive sickening among the guests at this lunch it was evident that some injurious article of food had been served. Suspicion fell first upon one thing, then upon another and as nearly everyone had partaken of several different dishes it seemed difficult at the outset to identify the offending one. The shrimp salad was of course suspected but it was ascertained that none of this had been sent to the orphan asylum where the sickness had been very extensive; so this was ruled out. Close inquiry established it beyond question that everyone who had been ill had eaten beef sandwiches while those who were positive that they had not eaten any of the beef had escaped. It was therefore decided to make the beef the subject of experiment and investigation. The amount of material available to work upon was small, but fortunately a few of the left-over beef sandwiches were obtained.

On account of the severity of the gastric symptoms an irritant poison was considered among the possibilities and therefore the beef was subjected to tests for arsenic, corrosive sublimate, lead and the various chemicals used as food preservatives. This work was done carefully by the yard chemist, but all the tests applied gave negative results. A bacteriological examination was next undertaken by Dr. Hogan, Assistant Inspector of health for Vallejo, and Hospital Steward Wildasin, U. S. Navy, of the Mare Island hospital. A culture from the beef showed an active motile bacillus. This was isolated by Wildasin and finally de-

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cided to be the bacillus enteritidis of Gartner. A pure culture having been obtained a rabbit was injected with it. The animal died in two hours and forty minutes. The same bacillus was afterwards obtained from the spleen of the animal that had been the subject of experiment and hence the identity and poisonous nature of the bacillus seemed to be well established.

The bacillus enteritidis was discovered by Gartner in 1888 under the following circumstances: A man died with symptoms of a severe gastro-enteritis and it was ascertained that he had recently eaten the flesh of a cow that had been killed on account of an intestinal affection. From the flesh of this cow and from the spleen of the man the bacillus in question was isolated and the conclusion drawn that the bacillus was the cause of death. Further experiment by other observers in similar cases of illness confirmed this discovery of Gartner and since then a number of cases of poisoning from this source have been recorded; but the epidemic at Mare Island developed more cases than all previous epidemics combined. On no other occasion has the poisoning occurred on so large a scale.

It is now generally accepted that the bacillus enteritidis is the usual cause of true meat poisoning. Another form of poisoning but less frequent is that due to the bacillus botulinus of Van Ermingham. It is this latter organism that has given rise to the names, botulism, allantiasis and sausage poisoning. The symptoms in man of the two forms of poisoning differ materially. An equally important distinction is the fact that in the case of botulism the infection of the animal takes place after it is slaughtered. The microbe is therefore a saprophyte and the meat develops an offensive odor. Its unfitness for food is apparent to the senses. The bacillus enteritidis on the other hand affects the animal while alive and makes it ill, though the flesh to all microscopic appearances is not tainted. The meat from which the sandwiches were prepared was apparently sweet and fresh: there was nothing about it to arouse suspicion.

Animals infected with the bacillus enteritidis have been found to be suffering with puerperal fever, uterine inflammation, diarrhoea and septic poisoning. If the temperature of the animal be taken it will be found to be above the normal. The bacillus

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has been found most frequently in cows and calves. Horses, goats and less frequently pigs have been infected also, but thus far no case is recorded where mutton has given rise to this form of poisoning.

It would seem that the only way to guard against infection of man by this bacillus is a very careful inspection of animals before slaughter and to make sure that they are in no way ill. If once the meat is put upon the market the danger of poisoning is great for there is nothing about it to attract attention. The micro-organism is not readily killed by cooking. Only a high temperature is fatal to it and this temperature is not likely to be reached in the interior of the meat. Meat which has been cooked may offer a good soil for the propagation of the bacillus and therefore the more time that has elapsed since cooking, the more numerous the bacilli are likely to be. As the meat of the sandwiches under discussion was cooked forty-eight hours before it was eaten we may here have a reason for the very extensive poisoning that resulted. It is not known how the animals become infected in the first place, but the bacillus is found in the flesh, in the intestinal contents, in the spleen and in other organs, usually occurring in small groups. Of course it is transmitted to man by eating the infected meat, but there is some evidence that it may be transmitted from man to man by the excreta.

The bacillus enteritidis has been classed with the paracolons and it closely resembles the paratyphoid bacillus. It is motile, flagellated, non sporogenous, aerobic, optionally anaerobic. In this latter respect it differs from the bacillus botulinus which is non-aerobic. Its form is short and thick and it is surrounded by a thin capsule. It stains by the usual methods excepting that of gram. It does not ferment lactose. It does ferment dextrose, maltose and dextrin. It does not produce indol and this is one means of differentiating it from the colon bacillus. Upon gelatine plates it forms round gray translucent colonies. It does not liquefy the gelatine.

The post mortem appearances in cases of poisoning by this bacillus are those of an active gastro-enteritis. The intestine is inflamed, the lymphatic follicles are swollen and sometimes evidences of haemorrhage are found. The spleen may be somewhat enlarged. The bacilli are found in the intestinal contents.

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The symptoms correspond with the post mortem findings, but vary very much in intensity. The more severe cases are ushered in with rigors or chilliness. Faintness follows and great muscular weakness. Vomiting and diarrhoea are copious and there are sharp pains in the abdomen and sometimes in the chest. The temperature rises to 103 or 104 and the pulse becomes rapid and feeble. The duration of the illness is in proportion to the severity of the attack. The case longest in recovering that came under my observation was nearly three weeks. Many recovered completely at the end of two or three days and the majority suffered for only a few hours. It seems to me quite probable that poisoning from this bacillus may often occur without its true nature being recognized, the patient and physician regarding it merely as a case of ordinary indigestion. It is only when poisoning occurs on a large scale as on the occasion under discussion that attention is attracted and some specific infection suspected. The liability to overlook the true cause is all the greater from the fact that the meat itself does not present any characteristic appearances and is not in any way offensive or unpalatable.

In comparing poisoning from bacillus enteritidis with that from the bacillus botulinus we find a marked distinction in the symptoms and in the condition of the diseased meat. The bacillus enteritidis affects the gastro-intestinal system while the bacillus botulinus affects chiefly the nervous system. In the latter form of poisoning there is ocular disturbance, the recti muscles of the eye are paralyzed, vision is impaired, there is difficulty in swallowing and in speech. If the disease proceeds to a fatal termination there is dyspnoea and heart failure, perhaps bulbar paralysis. But throughout all the attack there is no fever. As before remarked meat infected with the bacillus enteritidis is apparently in good condition: that infected with bacillus botulinus is manifestly tainted.

There is little to be said about treatment. In these cases that came under my care calomel or castor oil was given to clear the intestine and abstention from food was enjoined until vomiting and diarrhoea ceased. After that a cereal diet was allowed and in some cases tonics were administered. A too speedy return to albuminous food is apt to lead to a recurrence of the symptoms.

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PNEUMONIA AND ALLIED DISEASES AT THE NEWPORT TRAINING STATION.*

By Medical Director OLIVER DIEHL, U. S. Navy.

IN looking around for a subject for a paper requested by the Surgeon General of the Navy, to be read at the annual meeting of the Association of Military Surgeons, it occurred to the writer that the incidence of pneumonia and allied pulmonary diseases at our Training Station might be of interest; more especially, as the paper might lead to a discussion of the question of the predisposing influence to these diseases by barracks life, and bring about a comparison between the Army and Navy and between posts under different climatic conditions in the former.

As is well known in the Navy, our Training Stations have for years been subject to invasion of contagious diseases, some persisting with such constancy that they may be regarded as endemic. These infections are attributed to importation by recruits coming from infected districts or to exposure while on liberty, and possibly to exposure to existent germs at the stations.

Among the more serious diseases which have from time to time occurred, not infrequently as epidemics, are diphtheria, cerebro-spinal meningitis and scarlatina, while the less serious diseases like measles, mumps and German measles are almost constantly, at least at Newport, present.

It is expected that the frequency of incidence of the diseases mentioned, the causative organisms of which are known and the communicability of which is established, will in time be reduced by stricter methods towards prevention.

Typhoid fever, which has also occasionally occured, is now regarded as preventable by timely vaccination.

With this brief reference, as an introduction, to conditions generally, the diseases referred to in the title, the prevention of which is a more complicated problem, will now alone be considered.

To illustrate the damage done by pneumonia, broncho-pneumonia and the various forms of pleuritis at the Newport Train-

*Read by title at the 20th Annual Meeting.

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ing Station, the writer has compiled from the records of the Newport Hospital some tables which, summarized, show that during fourteen years (1897 to 1911) there were admitted from the Training Station:

436 cases of Febris pneumonica with 36 deaths.
217 cases of Broncho-pneumonitis with 9 deaths.
111 cases of Pleuritis acuta with 1 death.
13 cases of Pleuritis chronica with no deaths.
42 cases of Pleuritis purulenta with 5 deaths.

The average yearly complement of apprentices at the station during these fourteen years was 1,535, which, for the purpose of estimating the ratio of incidence and mortality of these diseases, represents approximately a population of 21,500. The total number of deaths, from all causes, occurring among apprentices during this period was 112.

Converting the above data into ratios per 1,000 we have the following: (it was impossible to obtain data upon which to calculate and give ratios in terms of damage.)

TABLE I.

DISEASE	Ratio of admissions per 1,000 pop.	Ratio of deaths per 1,000 pop.	Ratio of deaths per .000 of total deaths
Febris pneumonica	20.20	1.67	321.00
Broncho pneumonitis	10.00	.42	80.30
Pleuritis acuta	5.20	.05	8.92
Pleuritis chronica	.60	.00	0.00
Pleuritis purulenta	1.95	.23	44.66

Do these figures indicate an unusual incidence of this group of diseases at the Newport Training Station?

In attempting to make an accurate comparison the writer encountered many difficulties. Owing to the brief time available very few data were obtainable and as regards incidence in civil life, cases of this class of diseases are not generally reported, mortality returns alone being available. For comparison with the Navy as a whole the reports of the Surgeon General have been heretofore too incomplete, the various diseases not having been sufficiently differentiated for this purpose.

The following table will, however, give an approximate idea of difference in incidence in various localities both in civil life and the Naval Service:

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TABLE II.

DISEASES	Locality and source of information	Ratio of admissions per 1,000 of pop.	Ratio of death per 1,000 pop.	Ratio of deaths per 1,000 total deaths
Febris pneu. -----	Newport Trng. Sta. 1897-1911 (Table 1.)	20.20	1.67	321.00
Febris pneu. -----	Navy as a whole. 1905-1908 and 1909. Except Newpt. (Surg. Gen. Report.)	3.49	.343	61.00
Febris pneu. -----	Navy as a whole including Newport 1895-1905 (Gatewood's Hygiene).	5.11	.463	----
Febris pneu. -----	Newport City 1903-1909 Incl all ages (Newport Board of Health).	----	.81	66.3
Febris pneu. -----	Rhode Island 1897-1902 incl. All ages (Report State Board of Health).	----	----	92.0
Febris pneu. ----	Northern States wholly or in part above 39th. parallel. All ages (Delafield in "Pepper's Amer. Text Book").	----	.69	61.43
Febris pneu. -----	U. S. Census 1900. All ages.	----	1.00	106.1
Febris pneu. -----	New York City 1901-1904 Incl. All ages (Osler).	----	----	172.00
Broncho-pneumonitis. --------	Newport Trng. Sta. 1897-1911 (Table I.)	10.00	.42	80.30
Broncho-pneumonitis. ------	Navy as a whole including Newport 1895-1905 (Gatewood's Hygiene).	1.82	.113	----
Broncho-pneumonitis. --------	Newport City 1902-1909 Incl. All ages (Newport Board of Health).	----	.32	25.49
Pleuritis All varieties ----	Newport Trng. Sta. 1897-1911. (Table I.)	2.58	.093	17.86
Pleuritis All varieties ----	Navy as a whole. Incl. Newport. 1895-1905 (Gatewood's Hygiene).	3.62	.019	----

Comparison of the figures of Table II, even allowing for considerable error, would undoubtedly indicate that the incidence of

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these diseases at the Newport Training Station is excessive. Especially when we remember that the figures representing incidence in civil life cover all ages, social conditions and occupations.

As already intimated this unusual incidence has for years been recognized, has been commented upon in the Reports of the Surgeon General and has existed not only at the Newport, but also at the Norfolk and San Francisco Training Stations and as far as has been possible, under existing conditions, every effort has been made to discover the cause for this unusual incidence and to prevent it.

Unfortunately we are yet without positive knowledge as to the manner of invasion of the causative organisms of these diseases. Pneumonia, more particularly, is attributed to the micrococcus lanceolatus, but in all these diseases we frequently have associated with it Friedlander's bacillus and the pyogenic streptococci and staphylococci.

And as regards incidence also, these diseases generally occur in association. This very fact suggested their discussion as allied diseases.

The records of the Newport Hospital show that during periods of unusual prevalency, of any one of these diseases, viz: pneumonia, broncho-pneumonia or pleurisy, some cases of the other two occurred. During some periods, pneumonia predominated, during others, broncho-pneumonia or pleurisy. As regards the latter the history of the station would indicate an unusual occurrence of empyema. Of the 42 cases of the latter, 14 were previously admitted with this diagnosis, 18 were primarily admitted with pneumonia, 3 with broncho-pneumonia, 6 with acute pleurisy and 1 with chronic pleurisy. To what extent influenza was associated with or the primary cause of these diseases cannot be determined, but the few available data would seem to indicate less influence than has been found in civil life.

As is known, the causative organisms are found in the upper air passages of healthy individuals supposedly becoming potent under conditions which lessen individual resistence to their presence.

Pneumonia at least, is generall y regarded as being communicable, and has occurred in localized epidemics. As bearing out this point, the following table is submitted:

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TABLE III.

Year	Training Station		Newport City Average pop. 28,000
	Ratio of admissions with pneumonia per 1,000 pop.	Ratio of deaths from pneumonia per 1,000 pop.	Ratio of deaths from pneumonia (all ages) per 1,000 pop.
1897 and '98	7.00	.87	No data.
1899	57.57	10.6	
1900	23.69	2.49	
1901	55.55	5.55	
1902	27.49	0.00	1.03
1903	63.73	2.58	.64
1904	14.31	0.00	.82
1905	19.78	0.00	.79
1906	24.04	1.71	.93
1907	8.31	1.55	.96
1908	21.38	1.52	.79
1909	5.57	0.50	.75
1910 and January 1911	14.89	2.41	No data.

It will be seen that the range of incidence at the Newport Training Station has been very irregular, ranging from 5.57 to 63.73 per 1,000 in individual years and the same irregularity exists in the death ratios. The death ratios for Newport City, which is practically under the same meteorological and climatic conditions, is much more regular and does not seem to bear any relation in this particular to the Training Station. Nor has the incidence at the Training Station shown any regular seasonal relation. These diseases, in civil life are more frequent during the winter and spring months. Reference to the hospital records for the fourteen years under consideration shows the following:

During 1897 and 1898 the admissions were so few that they are grouped together. In 1899, commencing with January, there was a sudden jump, 34 cases occurring during the first four months, with a high mortality. In 1900 there was a decline until November, when the cases again increased, continuing throughout 1901 even during the summer months. 1902 was characterized by a decrease in the early part of the year, a gradual increase during the summer and fall, the year of 1903 again opened with an excess and continuing during the summer, May having 16 admissions, June 11, July 7, August 6 and September 2. During 1904 and 1905 the incidence was comparatively low. In 1906, of the 43 admissions, 26 occurred in March alone. In 1907 the ratio was again low. In 1908, of the 42 admissions, 19 occurred in July and 9 in August. In 1907 the ratio of admissions was the lowest in any of the 14 years under consideration. 1910 was

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characterized by a high mortality, mostly from empyema originating as pneumonia.

As further evidence of the occasional epidemic occurrence the hospital records show that during these periods cases were admitted in groups, as many as six in one day and that there were periods of quiescence even during the winter and spring months. Also that all these facts would indicate exposure to a common source or to foci of infection and that the increased incidence at the Newport Training Station is due either to (a) the more or less constant presence of the causative organism in unusual quantities or that they possess unusual virulence or (b) the existence of some unusual condition in the locality, or in its inhabitants, which renders the latter unusually susceptible to, or lessens their resistence to invasion.

Inquiry establishes the fact that patients with this class of diseases do not come from any particular barrack, nor is there any evidence that the source of infection, if any, is limited to any particular building or set of buildings. Nor is it known whether any thorough search has been made for the causative organisms on any part of the station. Such a procedure, too, would scarcely be practicable with the present limited force. There is, however, no doubt that our Training Stations offer an interesting field for investigation in this direction.

The possible predisposing causes will now be briefly referred to.

In discussing the relative incidence at the Training Station, sex must be disregarded.

Since statistics show that not more than 10% of all cases of pneumonia occur between the ages of 15 and 30, apprentices should be at the most resistant period of life.

If, as has been claimed, pneumonia is more prevalent in a warm climate and high altitudes, this fact should be in favor of the Training Station.

Exposure to cold and wet and periods of unusually low temperature are also given as causes and as is well known the diseases in question are most prevalent during the winter and spring months. But the Training Station is practically under the same climatic and meteorological conditions as Newport City, and as already shown, the incidence is greatly in excess and the seasonal range much more erratic at the former place. It has been claimed that many of the recruits come from more

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equable and milder climates and are unaccustomed to the great meteorological changes in the locality of Newport. But investigation shows that disease is not confined to recent arrivals but that many develop the diseases in question after a sufficiently long stay for thorough acclimatization.

As regards occupation the open air drills and physical exercises should theoretically strengthen resistance to disease.

As regards clothing, food and general supervision our apprentices should be at an advantage compared to the average person of the same age and social condition in civil life.

Having now considered the principal factors which have been generally regarded as bearing upon these diseases let us now quote various authors upon the question of other insanitary living conditions and environment.

"Pneumonia occurs more frequently in crowded, dark and ill-ventilated dwellings than where the supply of light and air is ample. The life of the tenement house is peculiarly favorable to its development. Fortunately the germ is short-lived, or the disease would become endemic in such locations. As it is, the conditions render the lungs especially vulnerable to the action of the specific organism and increase the chances of infection." (Smith, Twentieth Century Practice of Medicine). "The habitual breathing of vitiated air." (Anderson, Twentieth Century Practice of Medicine, Lobular Pneumonia). "The disease may occur in epidemics, confined to prisons, barracks, asylums or involving certain districts. There seems to be no question that persons living an out-of-door life in the country are less liable to the disease than are persons living in the cities." (Delafield in American Text-Book). "Children crowded together in asylums are especially liable to the disease." (Broncho-pneumonia, Delafield, American Text-Book).

And does this fact account for the lessened incidence in civil life? Dwellings in civil life, especially when families are small, although perhaps not under equally good hygienic conditions, differ from barracks where a large number of persons are quartered in the fact that when disease occurs a smaller number are exposed to infection and the disease is more readily limited.

The so-called "unit system" is undoubtedly the ideal one and the writer understands that it is the intention to adopt it as far as practicable at the new Training Station at Chicago. But until

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the system is extended to the older stations can not something more be done to lessen disease at these? Are the conditions in the present living quarters of the apprentices such as predispose to infection? Are they open to the sunlight, thoroughly ventilated and is the space sufficient to prevent vitiation of the air? Are the floors shellacked or prepared in such a manner as to reduce to a minimum dampness occasioned by necessary cleaning? Is expectoration prohibited and are the sputa looked after? Are the quarters frequently fumigated? Is the efficacy of serum-therapy sufficiently established to justify its use in treatment for prevention?

The writer has no personal knowledge of conditions in these particulars at the various Training Stations, but in an inquiry as to the reason for the excess in incidence of disease, this line seems indicated.

The purpose of this paper is intended to be suggestive, not to solve a problem nor prove a theory; to present a condition and offer a subject for discussion.

As the highest function of the Medical Officer is the prevention of disease it has occurred to the writer, as a member of this Association that the presentation, discussion and concerted investigation of some such subject would be more profitable than the relation of isolated cases. The experience of army officers whose familiarity with diseases incident to barracks life and of officers of the National Guard, who have a large civil practice, should be valuable for comparison with that of officers of the Navy whose practice generally lies in a different field.

The question of venereal prophylaxis is now well to the fore. Whether it will prove as efficacious as has been claimed has yet to be determined. Pneumonia and the allied diseases, especially in the Navy, come next in frequency and seem to the writer to be equally worthy of consideration.

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QUARTERLY REPORT OF THE BOARD FOR THE STUDY OF TROPICAL DISEASES AS THEY EXIST IN THE PHILIPPINE ISLANDS—MARCH 31, 1912.*

By Major P. M. ASHBURN, Medical Corps, U. S. Army; Captain EDWARD B. VEDDER, Medical Corps, U. S. Army, and First Lieutenant ERNEST R. GENTRY, Medical Corps, U. S. Army.

IN January, two of us (Ashburn and Gentry) joined the Board as new members, taking the places of Major Chamberlain and Captain Barber. A number of days were occupied in getting settled and in transferring property responsibility, and the whole Board was then ordered to Hongkong to attend the second biennial session of the Far Eastern Association of Tropical Medicine. A synopsis of the proceedings of that meeting is attached. It was the end of the month when we got back to Manila, and we then found that our laboratory was being painted and we could not use it for another week. It therefore appears that the Board did practically no work in the laboratory until the sixth week of the quarter, though Captain Vedder was continuing some experiments on fowls almost up to the time of our departure for Hongkong. After our return Captain Vedder was particularly anxious to continue the work of investigation as to the nature of the beriberi and neuritis preventing substances in rice polishings and as he had long been working on the same subject, was familiar with it and deeply interested in it, it was the unanimous opinion of the Board that he should continue, and he has done so.

Inasmuch as he is doing that work alone and in a way has made the subject his own, it seems only just that he should, when ready, publish his conclusions under his own name. The Board, however, has decided that in general Board work shall appear as such and signed by all members, and not as the work of an individual. It is thought that this will make for conservatism and reliability, as it is much less probable that three men will be led astray by an attractive hypothesis than that one may be.

*Report made to the Surgeon General, U. S. Army.

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Captain Vedder says in regard to this quarter's work with fowls, that:

"The results so far obtained, while interesting, do not warrant publication as a separate article. However, one experiment that has been performed is believed to be of importance. Since individuals on a well-balanced diet do not acquire beriberi, except, possibly in the rarest instances, and since an exclusive diet of polished rice is decidedly an unbalanced ration consisting almost wholly of starch, it has seemed possible to some observers that beriberi may be due not so much to the absence of some specific food principle as to the unbalanced ration consumed.

"In order to test this possibility fowls were fed on a balanced diet consisting of substances each of which had previously been tested separately and proved to be ineffective in preventing polyneuritis gallinarum. The diet given to these fowls consisted of highly milled rice, cottonseed oil, egg albumen, sugar, asparagin and inorganic salts, given in doses that were believed to be sufficient in quantity, judging by the quantity of these substances contained in rice polishings.

"It will thus be seen that these fowls received fats, carbo-hydrates, albumen and inorganic salts in sufficient quantities, but as they nevertheless developed neuritis, it is apparent that a balanced diet per se will not prevent this disease, but that there is a specific neuritis preventing principle which is present in some articles and absent in many other articles generally used as food."

As it did not appear necessary or wise that we should all work on the rice polishings, Major Ashburn and Lieutenant Gentry took up the subject of sprue as being one concerning which relatively little is known, one of some importance, and one most intimately related to the Tropics.

The work done thus far has not shown any results worthy of publication and has consisted of efforts to obtain cases for study, mostly from civilian sources, examinations of cases thought to be sprue; examination and observation of cases known to be sprue, the preparation of a routine scheme of examination of patients, blood and feces, cultures from stools, saliva, etc., and leisurely investigation of the literature. Thus far we have had but two undoubted and well marked cases of sprue and one of them was under observation for a few days only. The other patient, a

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civilian, has been under our observation in the Division Hospital for a month and has afforded us much instruction.

The main and most definite bit of information that we have gathered thus far is that the diagnosis of sprue is not always a simple matter. Among cases referred to us as such, two had all their symptoms and physical signs accounted for as follows:

One has locomotor ataxia.

One has tertiary syphilis with bone lesions, positive Wassermann, and profound anemia, with a blood picture as follows:

Red Cells	880,000
White Cells	3,200
Hemoglobin	25%
Small Lymphocytes	13.
Large Lymphocytes	9.3
Mononuclears and Transitionals	2.6
Polymorphonuclears	74.
Myelocytes	1.

Red cells show very marked poikilocytosis and polychromatophilia, a high grade of granular degeneration, numerous nucleated cells, a majority of which are megaloblasts.

Two cases have advanced chronic dysentery and much to suggest sprue, but we are not sufficiently sure of the existence of the latter disease to use them as material. Two patients have so far recovered from sprue as to regard themselves as cured and to afford us but few data. One case, a child, has completely recovered from a disease said to have been sprue. Two patients, both school teachers, have had sore mouth and the diagnosis of sprue has been made by two excellent physicians of large experience in tropical medicine, yet both are in excellent condition and free from other symptoms except such as point to neurasthenia.

FILARIASIS.

Learning that there were two cases of filariasis in Bilibid Prison we hoped to be able to make further observations on *F. philippinensis* and to determine if practicable the correctness of the views of Ashburn and Craig, which are called in question, though not in so many words, by the later publication of Phalen and Nichols.

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Blood was obtained from each case for each of the twenty-four hours, but no filaria was found in any specimen from one case, that had had salvarsan intravenously; and only one in each of two specimens from the other case, which had had intravenous injections of quinine. Whether or not the treatment was at all responsible for these findings we do not know, but at any rate the numbers of embryos were so small and the finding of them such a tedious labor that it was not deemed worth while to undertake work with those cases. The matter is therefore in abeyance.

NEW LABORATORY.

Much disappointment was felt when it was learned that the new laboratory, asked for months ago, was not to be furnished, but the cessation of building operations at Camp Stotsenburg freed a considerable amount of money already assigned to the Division, and we are now able to report that the Division Commander has allotted $3,000.00 of that for the purpose of making a laboratory for this board. Plans have been drawn and estimates made and it is hoped that work will soon begin on the construction of a second story over the present dispensary wing of the Division Hospital. This will give us a well arranged and, it is hoped, a satisfactory location, with abundant light, air and plumbing and a total floor space of approximately 74 by 30 feet. When that is obtained it will be practicable to install an equipment which should meet nearly all requirements of Board work for some years to come.

AN ACCOUNT OF THE SECOND BIENNIAL CONGRESS OF THE FAR EASTERN ASSOCIATION OF TROPICAL MEDICINE, HONGKONG, JANUARY 20TH TO JANUARY 27TH, 1912.

This meeting was quite a successful one and must, like its predecessors, make much for the advancement and correlation of medical research in far Eastern countries. It was well attended and representatives were present from Australia, India, Ceylon, Java, the Straits Settlements, the Federated Malay States, French Indo-China, Macau, Hongkong, Kiautschcu, the Philippines, the Chinese treaty ports and Japan. The military and naval serv-

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ices of the United States, Great Britain, France, Germany, Holland and Japan were represented. The average attendance at the meetings was probably about one hundred. The arrangements for the comfort and entertainment of visitors were thorough and delightful. An elaborate program of entertainments pleasantly filled the time not spent at meetings of the congress. The meetings were held in the town hall and were very well attended.

Large and interesting commercial exhibits, including drugs, instruments, operating room and laboratory equipment, a very large private collection of Chinese medicaments, and many interesting pathological specimens, including one series of six specimens showing large gummata of the heart, Doctor Swan's exhibit of a thousand vesical calculi and public health exhibits excited interest.

Much difficulty was experienced by most members in understanding papers read in other than their own languages, and discussions were not, therefore, either so general or so full as they should have been, and may be later when the papers are published.

The second day's sessions were devoted to the consideration of papers on beriberi, of which there were ten. The prevalence and economic importance of the disease in this part of the world and the large amount of experimental work which has been done in recent years in regard to etiology and prophylaxis combined to make this a subject of the greatest interest to the congress. One paper, that of Doctor C. N. Davis, of Shanghai, advanced the idea that the disease was transmitted by blood-sucking vermin, but otherwise there was practically no dissent from the view that the disease is related to the use of highly milled rice as a main article of diet.

Major Chamberlain and Captain Vedder, United States Army, presented a paper on "The Substance in Rice Polishings which Prevents Polyneuritis Gallinarum and Beriberi." A resolution was passed in which the Association recommended international action to promote the use of undermilled rice and to discourage the use of the overmilled, using a content of 0.4% of P_2O_5 as a standard.

The third day was devoted principally to the consideration of dysentery, cholera and plague. Doctor Gauducheau, Medicin-

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Major, Hanoi, reported observations on the multiplication of amoebae isolated from a case of dysentery and thought from animal experiments to be pathogenic, and showing a phase of flagellate existence.

Captain Vedder, United States Army, reported the results of an experimental study of the viability of amoeba when subjected to the action of various therapeutic substances and concluded that ipecacuanha possesses a remarkable amoebacidal activity, even in extremely high dilutions.

The papers of Strong and of Shibiyama showed the small amount of protection against pneumonic plague afforded by preventive inoculations. An illustrated talk by Doctor de Vogel of Batavia, Java, showed clearly the dangers in plague epidemics of rats harboring and dying in bamboo houses, and the ingenious methods adopted in Java to minimize this danger without doing away with the use of bamboo.

The fourth and fifth days' sessions covered a great variety of subjects. Doctor Freer of the Philippine Bureau of Science reported the results of the past two years' work in the study of tropical sunlight, giving the reports of the stations established in various parts of the world and showing that the actual amount of sunlight was not markedly greater in the tropics than at several points in the temperate zones, and also varied widely in different parts of the tropics themselves.

Doctor Jordan of Hongkong gave an interesting paper on CO_2 snow and demonstrated the method of preparation.

Doctor Swan read a paper on Vesical Calculi in South China, a report of over one thousand cases with a large exhibit of stones removed.

The sixth day was devoted to malaria, sanitation and quarantine regulations.

Captain H. M. Neeb of Batavia read a paper and showed drawings and blood specimens from a case of tertian malaria apparently showing sexual reproduction of the plasmodia in the circulating blood and paralleling the observations of Dr. Mary Rowley-Lawson on æstivo-autumnal malaria.

Major S. P. James, I. M. S., gave a talk on the desirability of uniformity of nomenclature based upon recognized and definite species in describing mosquitoes in different parts of the world,

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and exhibited his collection of Anopheline mosquitoes of India, which he is taking around the world as an aid in his missionary propaganda. An interesting specimen was one showing a sand fly with its proboscis inserted between the 3rd and 4th abdominal segment of an Anopheles, a fact suggesting to Major James the possibility of its so obtaining the parasites of malaria and later transmitting them to man.

Dr. Uthemann's paper on the necessity for uniform quarantine regulations for all the coast ports of China called forth much discussion and resulted in the passage by the congress of the following resolution of advice to the various governments represented.

Resolved, That the resolutions adopted at the last conference be amended to read as follows:

1. To have a definition of the Status Sporadicus and a common standard for the term Epidemic, when making reports to, or imposing Quarantine against, each other.

The following definitions are submitted for consideration:

Status Sporadicus in respect of any communicable disease means, the existence in a place, within the next preceding 14 days, of a case or cases of that disease, not definitely traceable to an imported case.

Status Epidemicus: Plague, Cholera, Small-pox, Yellow Fever, Typhus exanthemicus, Trypanosomiasis or other communicable diseases shall be considered to be epidemic in any port, place or defined locality, when after the first telegraphic report of the appearance or recrudescence of the disease, any weekly report thereafter shall show the occurrence of an average daily number of three cases, exclusive of cases imported into or originating in a quarantine station.

2. To circulate weekly returns of Plague, Cholera, Small-pox, Yellow Fever, Typhus exanthemicus and Trypanosomiasis and also of Plague in Rodents among the signatories; also telegraphic reports on the first occurrence of any of these diseases in a clean port or territory.

3. To issue a Bill of Health to all outgoing vessels, proceeding to a port of another signatory. Such Bill of Health shall inter alia state the facts as to the existence and prevalence of quarantinable disease in the port, place or defined locality and further shall contain such other information as may be desired or deemed necessary by any signatory, to enable such signatory to estimate the sanitary risk from the arrival of the vessel in its (the signatory's) ports.

4. To report by telegram to the country concerned, the departure of an infected or suspected ship (as defined by the Paris Convention) which may intend to proceed to any port in the territories of another signatory;

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and to endorse the Bill of Health of the said infected or suspected ship with a full account of measures taken to disinfect or otherwise deal with the said vessel.

5. To meet point (2) raised by Dr. Uthemann, the following procedure is suggested, viz.; That in respect of any vessel leaving a plague-infected place or carrying persons or suspected cargo from such a place (a place where there is plague in man or rodents) it is considered that no subsequent disinfection or fumigation should be imposed on the vessel at any port of call, if it can be shown (a) That the vessel has been properly treated for the destruction of rats and other vermin, (b) That approved measures of inspection or examination and personal disinfection of effects have been carried out in respect of all persons on board such vessels, and (c) If specially objectionable classes of cargo (to be scheduled) have been rejected or properly disinfected before shipment.

Provided further that it is understood that no evidence of Plague is discovered on board in man or rodent at any port of call.

6. In the opinion of this Association it is most desirable that the recommendations of the International Bureau of Hygiene which met in Paris in 1910 be given effect to, namely, that effective measures should be carried out to destroy rats on board vessels trading with plague-infected countries, independently of the existence of plague among such rats.

Point (2) raised by Dr. Uthemann of the Colony of Kiautschou was as follows:—

(2) Ways and means to either obtain uniformity in the different Quarantine Regulations or to have the present regulations (especially as regards disinfection) acknowledged and agreed to. The necessity of this is shown by the following instance: During the outbreak of plague in the spring of 1911, steamers running from Dairen to Shanghai via Tsingtau had to be fumigated first in Dairen (by a special system of fumigation); two days later on arrival in Tsingtau, again by means of the Giemsa Nocht Apparatus and once more on arrival in Shanghai (36 hours later) by means of the Clayton Apparatus. It is easy to be seen what great inconvenience this causes to trade and commerce.

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A STUDY OF THE DIAGNOSIS TAG.

By Captain MAHLON ASHFORD, Medical Corps, U. S. Army.

TO invite the attention of medical officers to more than momentary consideration of the diagnosis tag in actual service may seem absurd. I am convinced, however, that many officers are not fully cognizant of the manifold functions this card will subserve if used in strict compliance with the requirements of the Manual for the Medical Department. If the diagnosis tag is so used and if the *user* is aware of its possibilities, this card becomes of signal advantage:

1. In the location of missing wounded.
2. In the preparation of field reports of dead, missing and wounded.
3. In the compilation of accurate reports of dead, missing and wounded, at the base or War Department headquarters.
4. In the correct and instant estimate of the nature of the wound and the treatment required.

In the first place, I shall invite your attention to certain provisions of the Manual for the Medical Department concerning the use of the diagnosis tag.

1. These tags are made out in duplicate—one tag is attached to the wounded man—the duplicate kept in the book,—in the same manner in which the stub is kept in a check book when a check is uttered.
2. They are attached to the dead as well as the living.
3. The tags made out by a regimental personnel of its own wounded or killed at first-aid stations or elsewhere are turned in to the regimental surgeon for the preparation of his records.
4. Those made out by any sanitary personnel, of dead and wounded of other organizations than that to which they are attached are transmitted *promptly* to the Chief Surgeon, and by him without delay back to the senior medical officers of the commands to which they respectively pertain.
5. All the tags, both original and duplicate, having served their purpose in the preparation of casualty returns and registers are

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to be forwarded with the next Reports of Sick and Wounded from the several organizations engaged.

It will be observed that the manual emphasizes the value of the diagnosis tag in the preparation of field returns; and gives very definite instructions for the proper fulfillment of this function. There is no mention made, however, of the value of the diagnosis tag in the location of missing wounded; and yet I am convinced that these slips of paper will prove of utmost service in the location of missing wounded, and the salvation of many lives of wounded soldiers who otherwise would die of starvation and lack of surgical attention on the battlefield. In the present mode of warfare, owing to the open formation, with troops widely deployed; and to the extended range of the modern small arm and field artillery, the dead and wounded must of necessity become scattered over huge areas of country. Many of the wounded, even after they have received first-aid attention from the sanitary personnel, will be lost sight of in the advance or retreat of the troops; and will die from starvation or lack of medical attention; or at least suffer the tortures of one or the other before their ultimate return to medical supervision. In fact, in rapidly moving commands,—such as a brigade of cavalry on reconnaissance it is well recognized by the tacticians of our corps that it is impracticable for the sanitary personnel to establish first-aid stations during the performance of such duties; and it is expressly stated in the latest Manual for the Medical Department that with rapidly moving commands first-aid stations cannot be established until the engagement ceases or the movement is halted by darkness or other similar contingency. All that can be done in such conditions we are told,—and we find proof of the assertion in the mimic warfare of our maneuvers, is to render the prescribed first aid, tag the wounded, note the spot, and quickly remount and rejoin our commands.

Let us suppose that a regimental surgeon and his subordinates have complied with the requirements for the use of the diagnosis tag. The regimental surgeon has turned into his hands at the close of the day's engagement 65 retained duplicate diagnosis tags which have been applied by himself or his subalterns to the dead and wounded of the command. He receives from the Chief Surgeon 10 more tags applied by surgeons of sister regiments

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and turned in at once to the Chief Surgeon. He has, therefore, to account for 75 casualties. From the cards he finds that 15 tags were applied to the dead; 20 tags were applied to slightly wounded men who never got back of his first-aid station; at the brigade dressing station he finds 20 more of his men and at the field hospital he accounts for 15. He still has 5 wounded men who received first aid and still are missing. Captain Jones signed the tags of 3 of these and he being summoned recollects that he dressed these men, who fell just as they came out of the woods at X. He sends two squads to the point indicated, and there the 3 men lie hidden in the shrubbery at the edge of the woods. Sergeant L., who signed the other tags, similarly locates his 2 wounded, who otherwise might have lain in neglect and agony until death ended their suffering. This is a fanciful picture, but it will serve to indicate the method by which the diagnosis tag may be utilized to locate the wounded and to reduce that tragic figure—present in all battle statistics—"The Missing."

In the second great function of the diagnosis tag there is nothing to be added to the very definite instructions contained in the Manual for the Medical Department. The regimental surgeon can readily formulate very correct statements of the dead and wounded of his command for the benefit of his regimental commander as well as his Chief Surgeon from the duplicate diagnosis tags,—provided the provisions covering their employment have been carried out by all concerned.

In the compilation of accurate records at the Base or Department headquarters the tags,—both duplicate and original, forwarded with each surgeon's Sick and Wounded Report, will undoubtedly have a distinct value in supplementing the information received from other sources.

Purposely have I placed last the fourth important use of the diagnosis tag, and that for which it was originally designed and whence it received its name. The tag gives an instant estimate of the nature of the wound received and the treatment given. From this information the examiner can quickly deduce what disposition to make of the case. The unfortunate aspect of the matter is that many of us have considered this to be the chief if not the sole purpose of these tags; and have been inclined to regard their uniform application to wounded as a sort of refinement of

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first aid,—more suitable for display than practical utility. Such is not the truth. While it may not be admissible that the use of these tags for record purposes is of greater importance than their employment as a means of determining the nature of the injury and the treatment administered; it is certainly true that if this tag system is utilized to account for casualties and to locate the missing, it has then achieved its greatest function. It would seem not unwise to re-christen these tags by some title such as "Casualty Tags," in order that the beginners in the study of the science of field aid to the wounded should not become imbued with the false conception that diagnosis tags are merely to inform the examiner that yonder legless man has had his legs shot away. There is no doubt that this erroneous impression does exist in the minds of many medical officers of the Regular service and of the National Guard and that, if it is not erased, will result in careless or indifferent application of a most valuable adjuvant.

One of the questions which I have been most frequently asked by officers of the Guard is: "Is this the station where we put on the diagnosis tag?" The new Manual for the Medical Department expressly states that the diagnosis tag will be put on by the first medical officer or noncommissioned officer who sees the patient prior to his admission to hospital, irrespective of the place, the time, the station—whether it be on the firing line; at the first aid station; at the dressing station; or elsewhere.

There are two more points to which I wish to invite attention. The first is in the matter of the duplicate retained tag. It requires perhaps one minute to make the original tag, and an additional minute to make the duplicate. If the medical officer will have the foresight to provide himself with a slip of carbon paper similar to that used by physicians in their prescription book he can make both original and duplicate tag simultaneously and they will be identical. If he uses an indelible pencil the record becomes permanent and does not blur. Time and labor are thus saved at a time when every moment may be priceless; and permanency of record is achieved. The second point is in the matter of adding to the value of the retained duplicate tag as a means of locating the missing wounded. Upon the reverse of each tag are a few lines for "Remarks." The officer who applies the tag

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could quickly jot down under "Remarks" on the reverse of the retained duplicate tag a brief statement of the location of the wounded man—in case he contemplates leaving him where he has fallen on the battlefield. It will take but one moment and may save hours of search to the rescuers and hours of misery if not life itself to the sufferer.

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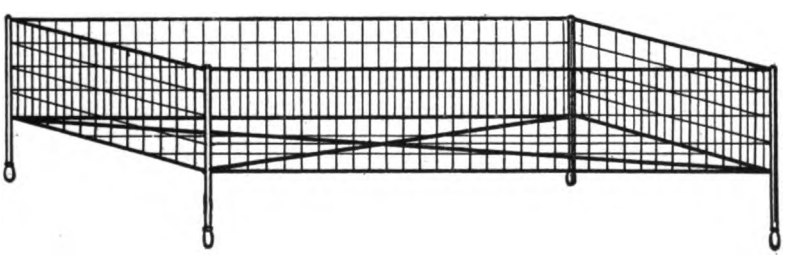
DISPOSAL OF GARBAGE IN BARRACKS.

By Captain PERCY L. JONES, Medical Corps, Commanding Ambulance Company No. 3, Fort Leavenworth, Kan.

REMEMBERING the excellent results obtained at the Manoeuver Division Camp in Texas by incineration of garbage, the author concluded that the same results might be accomplished in barracks. There is the advantage in barracks of having a sewer to carry away practically all of the liquid constitutents. The only difficulty is to separate the solid from the liquid garbage. The rest of the procedure *under close supervision and care* is a simple matter.

The following method has been found very successful since arriving at this post—Sept. 9, 1911. In barrack kitchen there are two large galvanized iron sinks, 4 feet by 2 feet by 1½ feet, one used for general police, and the other for washing dishes and cooking utensils. These are drained by a two-inch pipe, trapped just below sink, and at entrance to sewer. In addition to the usual safeguard to drain, a large wire basket, ¼-inch mesh, 2 feet by 2 feet by 4 inches, supported by 1-16 inch wire pedestals, made by the mess sergeant, has been placed in one of the sinks.—see sketch. All the garbage is emptied into this basket and



allowed to drain. Until it was necessary to start the winter fire in the furnace, the solid garbage, after draining, was wrapped in small bundles, and burned in the small furnace used for heating water in the basement of the barracks. Some of the bundles were burned in the kitchen range while it was not being used in the preparation of meals. Since starting the winter fires, all the

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bundles of garbage have been transferred to a galvanized-iron can and fed directly into the large furnace. When judiciously handled this does not interfere with the heating of building and adds very little to the duties of the fireman.

Within two hours after the completion of the meals all garbage is consumed by the fire. In my own home this method works equally well by using only the kitchen range.

Cans and other noncombustibles are drained and carted away with the ashes.

It might appear that the drain would frequently become occluded with grease and garbage accumulations, but such has not been the case. For the sake of argument let us grant that this might occur. Even so, would it not be economy on the part of the Quartermaster's Department to install larger drains, such as those used in toilets with the addition of grease trap? With this method there is very little increase in the amount of liquids which ordinarily goes through the sewer.

Where there is no furnace available in which the garbage can be consumed it can be burned in the kitchen range. This is always available from 6. P. M. to 4 A. M., and, if necessary, a special man can be detailed for the purpose.

By way of suggestion to those whose homes are not provided with the large army range, why not use the "oil paper bag" (something on the order of those used in the recent cooking fad) to store the garbage in a sanitary manner, inaccessible to flies until such time as it can be carried away.

There are the following objections to methods generally employed in posts for the disposal of garbage:

(1) The service is improperly supervised and irregularly performed.

(2) Frequently it is turned over to civilians who pay a nominal sum for the garbage, which is used to feed hogs. Their transportation generally consists of ordinary wagons and barrels with loose-fitting tops. In transferring from the galvanized-iron cans to the barrel a tin bucket is used.

(3) When carted away by the "army cart," it necessarily means the expense of teams, drivers, and service of prisoners with guard, besides the erection of numerous wooden stands.

(4) Even under supervision of guard, waste invariably occurs, rendering the surrounding ground moist and thereby contributing

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every factor necessary for the incubation of flies. Verily a fly incubator in rear of each barrack during summer months.

(5) Difficulty, it might be said impossibility, in securing and maintaining tight-fitting tops for cans.

(6) Danger of being overturned by prowling dogs.

(7) These stands are unsightly, malodorous, and insanitary.

(8) Even when placed in cans in a most sanitary manner the question of disposal still remains.

(9) The average person is ignorant in regard to the danger likely to result from improper disposal.

If this system of disposal of garbage is adopted at any garrison it is necessary to secure the co-operation of the line officers in order to make it effective. It is believed, however, that a medical officer should be detailed to supervise, inspect, and make frequent reports to the commanding officer through the surgeon. All medical officers are trained to scrupulously guard and carefully disinfect human excreta—why the apparent disregard of discarded food which is about as dangerous?

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SALVARSAN AND MALARIA.

By 1st Lieut. R. H. GOLDTHWAITE, Medical Corps, U. S. Army.

REPORTS of the use of salvarsan in malaria have been scarce in American journals, so the present case is cited as of interest to those who have severe and intractable, or relapsing cases to deal with.

Private John ———, Battery "B," 1st Field Artillery, was admitted to the Post Hospital, Fort William McKinley, P. I., April 13, 1912, with chills, fever, and severe backache.

Family History.—Negative.

Previous History.—Typhoid fever in 1902. Malaria in Arkansas some years ago and again at Hospital, Fort William McKinley, P. I., one year ago, for which he was under treatment twenty-two days.

Habits.—Alcohol moderate.

Venereal.—Chancroid 8 months ago.

Present Illness.—Patient had been sick two days previous to admission to hospital. On admission he complained of fever and backache. Temperature, 104.4° F.; pulse, 80. Blood examination next morning showed malarial parasites, estivo-autumnal, and quinine was started at once by mouth, grains 10, t. i. d. He vomited twice that day; on the following day he had another chill with more vomiting, and blood and blood casts appeared in the urine. Quinine, grs. 15, was given intramuscularly in addition to doses by mouth, and on the 16th temperature was normal, and renal hemorrhage had ceased.

Quinine by mouth in capsules was continued, 30 grs. daily, and temperature remained normal until April 23rd, when a much more severe chill, with temperature 105° F. occurred, accompanied by severe pains in the back. The urine was dark, and on examination showed numerous blood cells, blood casts and albumin. The amount of renal hemorrhage diminished progressively in the next few days, disappearing on the 28th. The temperature yielded gradually to the quinine administration, reaching normal on the 29th. Pain in the head was very troublesome April 26-28th, requiring an occasional hypodermic of morphine to afford relief and permit a few hours' sleep.

Symptoms had pretty well abated on the 30th except for extreme weakness, but on that night a severe chill occurred, with a temperature of 104.6 F. remaining in that vicinity until 8 a. m. in spite of several cold sponge baths. Coincident with this exacerbation there occurred another renal hemorrhage, more severe than the others. Medication by mouth was stopped entirely, and two daily intramuscular injections of 1.5 gms.

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quinine each were given, using buttocks and scapular areas in rotation to prevent excessive local irritation. May 1-5th temperature continued to rise to 103° or 104° daily and was over 101° most of the day. Renal hemorrhage continued, but became very slight in amount after the first two days. On May 5th examination of the blood showed haemaglobin 10%; red corpucles 1,152,000; white corpusles 6,500. The patient was so anemic that pressure on the limbs caused no appreciable change of color and the whole body was shrunken and of a gray yellow color. He was too weak to raise his head. Hypodermic stimulation was given on the night of the 5th, and on the following morning 0.6 gms. salvarsan was given intravenously. Temperature at times of administration was 101°, and rose during the day to 102.6°, but no further untoward symptoms arose. The daily temperature rise became progressively less during the next three days, and ranged between 99° and 101° from May 9th to 15th, after which it became normal and remained so.

Quinine in single daily doses of 1.5 gms. was continued for two weeks, after which he received 2 gms. on Saturday and Sunday of each week for six weeks and no quinine on the intervening days. Under tonic and supportive treatment his condition rapidly improved, and on May 23rd, 17 days after the administration of salvarsan, the haemaglobin was 65%, red cells 4,312,000, and white cells 8,000. Improvement has continued since that date.

This case, as far as it goes, seems to indicate that we have in salvarsan a very efficient weapon for use in relapsing or otherwise intractable cases of malaria that do not seem to yield to quinine. In a large number of cases of malaria seen in a year and a half of service at Camp Gregg and Camp Stotsenburg, this is the only case which did not yield to intramuscular injections of quinine. Its prompt recovery after the administration of salvarsan seemed therefore especially striking.

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2 Cerebrospinal Meningitis in the Military Establishment of Paris, 1909-1911. Pouy.
3 A Ventilator with Movable Adjustment. Bonnette.
4 Report of the 22nd Congress of Alienists and Neurologists of French Speaking Countries. Simonin.

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5 The Ear in Typhoid Fever. Dr. Vergues.
6 Aeration and Ventilation of the Cruiser Kleber (Continued). Dr. Duranton.
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10 *Report on the Health of the Russian Army, for 1909. War Department, St. Petersburg. Review by Dr. Keraval.
11 Sanitary Dogs. An Excellent Description of Methods of Training. Captain Tolet.
12 *First-Aid Packets in the French Army. E. Laval.
13 Congress of French Speaking Alienists, in Tunis; April 1 to 7, 1912.

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14 Plaster Cast of Hand for Mending Rubber Gloves. E. Laval.
15 Aeroplanes for Sanitary Purposes. Paul Bruere.
16 Utilization of Old Material Under the New Field Regulations. E. Laval.
17 Epidemic of Malaria at Camp Berkane, Morocco. Dr. Chatinieres.
18 *Military Hygiene. Editorial Remarks.

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10. **Report on the Health of the Russian Army for 1912.**—The total strength of the army, exclusive of officers, was 1,260,220 men, of whom 4,449 died of disease, a mortality of 3.53, or a little greater than that of the U. S. Army for the same year. Typhoid fever caused more deaths than any other single disease. It is surprising to note that scurvy is still to be reckoned with in the Russian Army, the ratio of admission being about one per thousand. Some of the regiments which suffered most (2.47 per thousand) being among those stationed in St. Petersburg. Anthrax, although becoming less frequent, has not yet disappeared; 45 cases are recorded, with only 2 deaths. During the Russo-Japanese War, cases of anthrax, nearly always benign, could be seen in most of the base hospitals, apparently the result of wearing sheepskin garments. Of leprosy, 85 cases were remaining in the army at the end of 1910. Two special hospitals have been established for their care and treatment.

Vigorous sanitary reforms have been instituted and carried out since the Manchurian War in regard to food, quarters, clothing and personal hygiene, resulting in greatly increased comfort and better health. The free use of tea (2.047 grams daily per man, with 25.60 grams of sugar), which is encouraged, and, to a large extent, takes the place of water, is considered a good prophylactic against water-borne infections, and a mitigant of the appetite for spirituous liquors. All recruits are quarantined on their arrival. Their hair and beard having been shorn, they are marched to the bath and afterward issued fresh linen and clothing while their own clothing is being disinfected. After the bath they are also physically inspected and vaccinated. Every effort is made to keep the men in garrison and away from saloons by means of varied games, choirs, dramatic entertainments, cinematograph, etc.

12. **First-Aid Packets in the French Army.**—In view of the great interest taken by all the other civilized nations in the first-aid packet, it is surprising to note its slow and imperfect evolution in the French Army. One was at last adopted in 1907, but its special merits are still mooted questions, owing to the fact that it is carefully preserved in depots, and its use, either during sanitary drills or maneuvers, prohibited. Its practical value, therefore, remains an unknown quantity. It is hoped that those medi-

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cal officers who have had occasion to use it in Morocco will report their experience and their opinion of it. Meanwhile, its shape, that of a cylinder, is objected to on account of its greater bulk when packed, compared to the usual flattened packet, and its propensity to roll off the table. Still worse, however, is the difficulty of opening it, which can only be accomplished by tearing the tough wrapping paper piecemeal. The contents must be completely unrolled before any can be used, and require too much handling to produce the best results.

18. **Military Hygiene, Editorial Remarks.**—France does not seem to be able to rid itself of the old traditional and deeply implanted notion that the evils of war are always inevitable, that sickness and death from inadequate preparation, lack of supplies and infectious diseases cannot be helped and must be heroically endured. Hence the strange shortcomings of the commissary and medical departments in the Morocco campaign. Thus a train, with its escort, left Casablanca for Fez without suitable supplies for the men who were soon reduced to hard tack and flour; the hard bread lasted but a short time and flour was the only food left; as wood for fuel was very scant, its cooking was necessarily very imperfect. The drinking water was mostly muddy and polluted, and no means were at hand for its purification.

V. HAVARD.

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August 5, 1912.

19 Investigations of the Foot Protector in the 1st Batt., 3rd Guard Regiment at Fuss. Bischoff.

20 Irregularity of the Pulse and Its Significance for the Military Service. Franz Sinnhuber.

21 Circulatory Disturbances in Early Tuberculosis and Their Significance for the Medical Officer. Victor Hufnagel.

22 Operative Cure of a Case of Gunshot Wound of the Gall-Bladder. Wiewiorowski.

23 Successful Suture of the Heart After Injury by Blank Cartridge. Simon.

24 Another Tablet to a Roman Medical Officer. Baas.

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August 20, 1912.

25 The Present Status of Local Anaesthesia. Conrad Pochhammer.
26 Garrison Ambulances. Georg Schmidt.
27 Medical Outfit for Medical Officers. V. Tobold.
28 The Packing of Medicines and Instruments Prescribed for Field Use. Kranse.

H. J. NICHOLS.

GREAT BRITAIN.

Journal of the Royal Army Medical Corps.

August, 1912.

29 John Hunter, F. R. S., S. G. and I. G. of Hospitals. Major H. A. L. Howell, R. A. M. C.
30 Cell-Inclusions in the Blood in Blackwater Fever; Second Note. Lieut. Col. Sir William Leishman, F. R. S., R. A. M. C.
31 *Recent Facts as to Enteric Inoculation and the Incidence of Enteric and Paratyphoid Fevers in India. Col. R. H. Firth, R. A. M. C.
32 The Papataci Flies (Phlebotomus) of the Maltese Islands. R. Newstead, M. Sc., A. L. S., etc.
33 Shelter Tents. Capt. N. Dunbar Walker, R. A. M. C.
34 *The Special Weakness, from a Medical Aspect of Volunteer Troops. Major H. E. M. Douglas, V. C., D. S. O., R. A. M. C.

31. **Recent Facts as to Enteric Inoculation and the Incidence of Enteric and Paratyphoid Fevers in India.**—The author states that in the year 1911, 170 cases of typhoid fever, with 22 deaths, occurred among the European troops in India. There was an admission rate of 2.3 per 1,000, and a death rate of 0.3. The case mortality was 12.9 per cent. One hundred and six cases, with eleven deaths, occurred among those who had been inoculated against typhoid, and 64 cases, with 11 deaths, among those who had not been inoculated. The ratio per 1,000 of admissions for typhoid fever among the inoculated was 1.7, and among the non-inoculated, 6.7. The death rate among the inoculated was .17 per 1,000, and among the non-inoculated, 1.15. The case mortality among the inoculated was 10.37, among the non-inoculated, 17.18. In 1911 there were 104 cases of paratyphoid, with two deaths. The specific organism was isolated from all these cases. The bacillus para-typhosus "A" was isolated from 103 cases, and the "B" variety in one case. One of the fatal cases was the result of intestinal perforation. The incriminating factor in all the

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cases of paratyphoid appears to have been the initial presence of an undetected and unsuspected infected person, indicating that in this disease man himself is the most dangerous factor of dissemination. There were in all then in 1911, 274 cases of typhoid and paratyphoid in India in European troops, with 24 deaths, as compared with 335 cases with 46 deaths in 1910.

Typhoid and Paratyphoid.

Ratio per 1,000.

Years.	Ratio per 1,000. Admissions.	Deaths.	Case mortality. Per cent.
1906	15.6	3.19	20.5
1907	13.1	2.77	21.1
1908	14.6	2.74	18.8
1909	8.9	1.58	17.7
1910	4.1	.62	15.2
1911	3.8	.33	8.75

The author states that the recognition of the widespread prevalence of typhoid in India is quite a recent circumstance In 1909 paratyphoid was regarded as an unusual occurrence. In 1910 with more critical methods of diagnosis of the pyrexias, 39 cases were recorded. In 1911 still greater care was taken and the number of paratyphoids rose to 104.

34. **The Special Weakness.**—The author states that enteric fever is by far the most important of the diseases which today affects soldiers. Whilst prevalent to some extent in garrisons, it is among soldiers in the field and especially in camps of more or less permanence, that its greatest ravages occur. He states that it must be laid down as an axiom that no camp of any size or permanency is likely to remain immune from this infection. The author then makes mention of the experience of the American Army during the Spanish-American War, and also of the brilliant results achieved by the Medical Department in the prevention of typhoid in the maneuver camps on the Mexican frontiers in the spring and summer of 1911. He states that the main preventive measure is, of course, inoculation. With regular troops the time for inoculation can be chosen, but there can be no attempt to inoculate the volunteers or territorial troops before they are mobilized. He again speaks of the experience of the Medical

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Corps of the U. S. Army on the Mexican frontier in 1910, and of the manner in which the troops mobilized there were speedily and effectively inoculated without bad results.

The trouble of blistered feet in raw levies, especially in the beginning of a campaign, will quickly reduce the total of effectives. Turenne estimates that after several days' marching about one-fourth of an infantry command would present excoriation of the feet, and military statistics in general show, also, that from 20 to 30 per cent of men sustain more or less injury to the feet as a result of a few days' marching, especially in the initial stage of their work. The author states he is informed that in the Army of the Potomac whole brigades suffered temporary disablement from this painful trouble. The territorial volunteer troops never wear their military boots in civil life and will inevitably suffer when first mustered into the service. In comparing the relative efficiency of territorial or volunteer troops and regulars nothing is more striking than the heart strain of individuals considered from the point of view of physical fitness. To put it shortly, the soldier first must be tuned up to the highest pitch of physical efficiency. This, in the case of regulars, is done by a long course of gymnastics and other training. Again, speaking of the Civil War, the author is informed that, in one of the volunteer concentration camps, out of 4,901 men discharged, 1,123 men suffered from some organic disease of the heart, and 1,200 from some functional form. The author in the last place speaks of smallpox, and says that in this we have not only to fight the disease itself, but also the crass prejudice of ignorance and crankiness. In the war of the Revolution the failure of the American invading army to achieve the capture of Canada was largely due to the ravages of smallpox. In the American Civil War there were 18,962 cases, and 7,088 deaths. In the Confederate Army of North Virginia, from October, 1862, to January, 1864, there were 2,513 cases and 1,020 deaths. In the Franco-Prussian War, the German troops, who had been carefully vaccinated, had only 278 fatal cases in a total strength of 913,967. On the other hand, among the poorly protected French troops, the deaths were said to have reached 23,400 from smallpox alone. Constans states that during the siege of Paris smallpox mortality among the besieged troops was no less than 6 to 7 per cent of the total. The

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French profited by their misfortunes, and thereafter insisted on a vigorous system of vaccination.

A. G. LOVE.

The Indian Medical Gazette Advertiser.

August, 1912.

35 *Nastin Treatment of Leprosy. Capt. L. B. Scott, I. M. S.
36 Mongolian Birth Marks; an Anthropological Study. Lawrence O. Fink, M. B., C. M. (Edinburgh).
37 Insanity in the Andamans. Major J. Woolley, M. D. (Cantab.), I. M. S.
38 Cases of Hydatid Cyst. Major Thomas Jackson, I. M. S.
39 Multiple Hydatidose Echinococcal Infection of the Abdominal Viscera. T. S. Tirumurti, M. B.

35. **Nastin Treatment of Leprosy.**—The author states that the Nastin treatment was first used by Capt. J. W. McCoy, I. M. S., in July, 1909, in the Sylhet Asylum. Up to the end of 1910, 271 injections had been given; during 1911, 433 were given; in all, 35 patients have been treated since the treatment first began. The general results have been eminently satisfactory. Almost every case has shown very marked and evident improvement. The author states that it is certain that mild cases may be so far improved as to local symptoms as to show no demonstrable signs of the disease. He states, however, that how far such a "cure" is permanent still remains to be seen. He is of the opinion that it may certainly be affirmed that the treatment has cured some cases to all appearances, and markedly improved every case without exception. It has definitely arrested the progress of the disease. The development of any fresh leprous lesion or serious symptom after treatment had begun has been very rare.

ALBERT G. LOVE.

SPAIN.

Revista de Sanidad Militar.

August 1, 1912.

40 Influence which the Customs of the Natives of Northern Africa have upon the Propagation of Cutaneous Affections. S. Gamuñez.

August 15, 1912.

41 *The Battle Against the Infectious Diseases During a Campaign. Fidel Pages.

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42 Fracture of the Left Femur and Contusions of the Chest and Abdomen. Dr. Gonzalez Granda.

41. **Infectious Diseases During a Campaign.**—The author of this article believes that one of the most important means to prevent the spread of infectious diseases among troops in campaign is the institution of quarantine hospitals. He cites the experience of the Japanese during the Rusisan-Japanese War to show the necessity for these hospitals, which were established at different places. They carried out the disinfection of ships, hospital boats, and transports proceeding from infected ports; of troops moving from infected localities to garrison others; and above all of the entire army before it returned home. All supplies sent to the front whether supplied by the Government or by private agencies were disinfected before distribution. During the war 1,289,621 persons and 3,944 boats passed through the quarantine stations; 1,222 cases of influenza, measles, typhoid and scarlet fever combined were observed, and only seven of smallpox.

A. C. CHRISTIE.

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REVIEWS

MANUAL OF PRACTICAL MILITARY SURGERY (LEITFADEN DER PRAKTISCHEN KRIEGS-CHIRURGIE). By Dr. Walter von Oettingen, late chief surgeon, Livonian Red Cross Field Hospital in the Russo-Japanese War. Published by Theodor Steinkopff, Dresden and Leipsic, 1912, pp. 377, 8vo. $2.50.

The present volume is an outcome of the experience gained by the author as chief surgeon of a Red Cross hospital maintained by a German-speaking Russian community, in which he had a varied experience at the very front as well as in rear zones. von Oettingen has gained for himself an enviable reputation as a writer on medico-military problems, although not connected with the regular army of his country. As an assistant to the late lamented Professor Bergmann, Germany's master-surgeon, his technical training has been such as to command respect whenever he has something new to say on strictly technical subjects. It cannot be denied that there is a great need of manuals on field surgery written to fit into modern schemes of sanitary organization, for the works the reviewer has had opportunity to study have all been more or less ordinary text-books of surgery with special reference to gunshot wounds. Added to this a chapter on the history of military medicine and surgery and the subject was exhausted. Senn was the first or at least one of the first to grasp the difference between military and civil surgery, but his untimely death robbed the world of an important work on this subject he had actually begun.

It would appear that the Russo-Japanese War, because of its gigantic aspects, both as regards personnel and territory, has proved a specially valuable "clinical experience" in the management of "traumatic epidemics." The literature on the strictly surgical aspects of that war that has appeared in the foreign literature is voluminous, but unfortunately these publications are articles in, at best, small monographs, not easily accessible to those not familiar with the Russian and Japanese languages. So far two complete text-books on field surgery have been the direct

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result of that war, one by the former chief surgeon of the Manchurian army, Professor Roman de Wreden, in Russian (which will be reviewed in the near future), and the present volume in German.

von Oettingen says in his introductory remarks that he has written a book such as he and his colleagues needed badly at the beginning of the war. There is reason to believe that the Austrian War Department has issued a circular on surgical activities, to prevent attempts at "practicing" in the field based on that work. The surgeon who imagines that he can go to the front to practice scientific surgery or test out new operative methods is, of course, unaware of the principles underlying field surgery and must be checked and directed to work along definitely prescribed lines with a view of bringing the greatest possible good to the greatest possible number in the shortest possible space of time with the least expenditure in material. A work written on any other basis will not be a proper guide even to the most skilful operator in the field. The reviewer after a thorough study of the volume under consideration is glad to say that the author has not only strictly adhered to this basic principle but has solved the many complicated problems in a masterful manner.

The book is divided into two parts, a general and special. In the former the author briefly but thoroughly discusses the weapons and ammunition and their effects, the healing of wounds with and without infection, dressing and surgical therapy in general. Organization and the transport problems form subdivisions of the general part. In the special part the diverse wounds are taken up regionally and their treatment discussed according to the zone in which aid is rendered.

Of course the work is based on the German field service regulations, but on the whole its perusal will prove of immense value to American medical officers.

von Oettingen has advanced the theory that inasmuch as superficial bacteria of the epidermis cannot be destroyed by any of our methods in vogue they should be rendered harmless by fixation. For this purpose he applies to the surface a solution of mastic, which unlike other preparations for similar purposes does not cover the epidermis with a false membrane but which remains

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glued to the skin and prevents the mobilization of the bacteria. The same substance also fixes dressings so that bandages to retain these dressings can be dispensed with. The reviewer can testify from personal experience that for the latter purposes mastic solution answers its purposes, which is proved by the fact that in his private clinic adhesive straps are no longer used for the extension of fractures of the lower extremities. The skin is treated with the solution and the bandages simply stay in place and sustain the weights. Whether or not asepsis can be achieved by the same method the reviewer has been unable to determine in the short space of time available for observation.

Another feature of interest is the demand by the author that no litters be used which cannot be converted into beds and vice versa. This, on purely theoretic grounds, seems worth the most serious consideration by our military authorities. Although our litter is as excellent a means of conveying wounded as any nation can show, it has nevertheless several disadvantages if the terrain of our operations be muddy, rainsoaked or very sandy. Besides, occasion may arise when a wounded man should be lifted onto the operating table and removed therefrom without having to leave the litter, and that cannot be done on our present models.

American surgeons will probably not agree with the author that spinal anesthesia has a decided place in field surgery. Assuming even that our medical officers were thoroughly familiar with the method introduced by Bier, the danger of producing meningitis under the conditions encountered in warfare seems too real to be entirely ignored. Ether and chloroform as general anesthetics are recommended, but nothing is said of the difficulty of transporting ether because of its bulk and inflammability. Finally, if a suggestion be not out of place, we miss mention of weapons used by savages. The last remark may not appear apropos, but the author has not failed to mention methods of fighting without arms so that a discussion of poisoned arrows, etc., would have made the work complete in every respect.

As regards the technical operations, especially in the base hospitals, one can say that the work leaves nothing to be desired.

G. M. B.

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PROMPT AID TO THE INJURED. By Alvah H. Doty, M. D., Late Health Officer of the Port of New York, Late Major and Surgeon, Ninth Regiment, N. G. N. Y. Fifth Edition. Octavo of 229 pages, illustrated. New York and London: D. Appleton and Company, 1912. Price $1.50 net, Postpaid $1.62.

The present edition of this book does not differ materially from previous editions. First aid books are of two main classes; those which make primary anatomy and physiology a large part of their course and those which are devoted to practical first aid alone. The present author has been consistent in his adherence to the former method. There is a good deal to be said on the other side of the question, however, and the majority of first aid instructors now realize that in any book on the subject, first aid should be emphasized and all extraneous matter omitted, otherwise the student learns a great deal which, interesting as it may be, is of little practical value.

A number of the descriptions are excellent. The author has, however, in numerous instances gone somewhat outside first aid and has encroached on the province of the surgeon. This tendency is one which must be constantly combated in teaching first aid as students are only too ready to assume responsibilities greater than they are qualified to undertake.

About twenty-five pages are devoted to hygiene and disinfection and the treatment of these subjects is necessarily too sketchy to be of much value.

It is noted that the book bears a red cross on a white ground. This is the insignia of the Red Cross and of the sanitary service of armies and navies, therefore it is not understood why it is used in this connection. It is not conceivable that either the publishers or the author have the slightest intention of trading on the Red Cross insignia.

PROGRESSIVE MEDICINE. A Quarterly Digest of Advances, Discoveries and Improvements in the Medical and Surgical Sciences. Edited by Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; Physician to the Jefferson Medical College Hospital; one time Clinical Professor of Diseases of Children in the University of Pennsylvania; Member of the Association of American Physicians, etc., assisted by Leighton F. Appleman, M. D., Instructor in Therapeutics, Jefferson

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Medical College, Philadelphia; Ophthalmologist to the Frederick Douglass Memorial Hopital; Instructor in Ophthalmology, Philadelphia Polyclinic Hospital and College for Graduates in Medicine. Volume III. September, 1912. Octavo of 353 pages. Philadelphia and New York: Lea & Febiger, 1912. Price, $6.00 per annum.

The contents of the present number of this quarterly digest with the contributors are as follows: Diseases of the Thorax and its Viscera, including the heart, lungs, and blood-vessels, by William Ewart, M.D., F.R.C.P.; Dermatology and Syphilis, by William S. Gottheil, M.D.; Obstetrics, by Edward P. Davis, M.D.; and Diseases of the Nervous System, by William G. Spiller, M.D.

Each contributor has carefully studied the literature of his subject and has abstracted it in a thoroughly satisfactory manner. So comprehensive is the scope of the abstracts, pertaining as they do to all the recent advances in the subjects to which they pertain, that within the limit of a review it is impossible to do more than invite attention to the care with which the abstracting has been done, and the consequent value of the quarterly to all who desire to keep up with recent improvements in the subjects covered by the present number of this digest.

A TEXT-BOOK OF GYNECOLOGY. By William Sisson Gardner, M. D., Professor of Gynecology, College of Physicians and Surgeons, Baltimore, Md. Octavo of 286 pages, with one hundred and thirty-eight illustrations in text. New York and London: D. Appleton and Company, 1912. Price $3.00 net.

This book is intended for the medical student. With this object in view, taking into account the limited time of such students, the author has stated the facts briefly and has omitted subjects which belong to general surgery. Many rare diseases have been treated very briefly and the greater amount of space has been allotted to common diseases with which it is essential the student should become familiar.

While the book is condensed as much as possible the essentials have been included and the facts are presented in a clear and satisfactory manner.

WEBSTER'S NEW INTERNATIONAL DICTIONARY OF THE ENGLISH LANGUAGE. Based on the International Dictionary of 1890 and 1900. Now Com-

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pletely Revised in all Departments, including also a Dictionary of Geography and Biography, being the latest authentic Quarto Edition of the Merriam Series. W. T. Harris, Ph.D., LL.D., Editor-in-Chief; F. Sturges Allen, General Editor. 2,700 pages, 6,000 illustrations. Springfield, Mass., U. S. A. Published by G. & C. Merriam Company, 1912. Price $12.00 net, full sheep binding.

This, the New Webster's Dictionary, is in reality a new dictionary of the English language. Its immediate predecessor was the Webster International Dictionary of 1890, with a supplement added in 1900. The present work is a thorough reconstruction embodying the most recent studies and lexicographic research. This volume of 2,700 pages has been in preparation for many years and for the past six years a large staff of competent lexicographers have been constantly employed in preparing it for the press.

The more important principles of the revision have been: a fuller application of the historical method to the old words of the language and an enlargement of the vocabulary representing the new coinage of words on account of the world's advance in many directions. In the present revision of this dictionary many improvements will be noted. Among them are those in the definitions. The vocabulary has been greatly enlarged as noted above, and the general information has been much increased. The arrangement has also been improved, much increasing ease in consultation, etc.

In a word, the new dictionary is modern, is thoroughly comprehensive and well arranged so that it may readily be consulted by the student.

THE CARE OF THE SKIN AND HAIR. By William Allen Pusey, A. M., M. D., Professor of Dermatology in the University of Illinois. Octavo of 182 pages. New York and London: D. Appleton and Company, 1912. Price $1.10 net.

This is an excellent little book. As the author states in his preface no special experience is necessary to realize how general is the desire for a healthy skin. His purpose in this book is to afford necessary knowledge on hygiene of the skin. He announces that the book is not intended to foster self treatment of skin diseases and is certainly not intended to promote the mischievous habit of self medication.

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The book contains chapters with the following headings: The Structure of the Skin; The Nutrition and Functions of the Skin; The Care of the General Health as It Especially Relates to the Skin; The Care of the General Health; The Local Care of the Skin, Water and Bathing; The Local Care of the Skin, Soaps and Powders; The Local Care of the Skin, Creams, Physical Methods, Etc.; Inflammation of the Skin; Disorders of the Face; Certain Defects in the Skin; The Hair; The Hair (Continued).

The author has attempted to explode a good many erroneous beliefs in regard to the care of the skin and hair. His hygiene for the skin is decidedly safe and sane. Moreover, much that he says on this subject is important from the standpoint of general hygiene. Of course this naturally is the case as the skin is not solely an envelope for the body but one of its essential parts which is subject like the rest of the body to general influences for good or harm.

A Collection of Papers Published Previous to 1909. By William J. Mayo, M. D., and Charles H. Mayo, M. D. Two octavo volumes, averaging 550 pages each, illustrated. Philadelphia and London: W. B. Saunders Company, 1912. Per set, cloth, $10.00 net.

In the preparation of these volumes the editor has been animated with the desire to collect and preserve a complete file of the writings of William James Mayo and Charles Horace Mayo from the time of their graduation from Medical College to February, 1909, the date of the publication of the first volume of "Collected Papers of St. Mary's Hospital." The latter did not contain all the articles published by the Doctors Mayo between the years 1905 and 1909 (the period to which they were limited), so in these volumes will be found articles of a later date than 1905.

Short articles and reports of cases have in some instances been omitted, especially where the data appeared to have been incorporated in later articles. But so far as possible the editor has incorporated all of the original subject matter; changes which would appear to indicate an attempt to bring such subject matter "up to date" have been carefully avoided.

The papers have been arranged by subjects. These are: Alimentary Canal; Stomach; Liver and Gall-Bladder; Pancreas; In-

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testine (General); Intestine (Tuberculosis); Intestine (Cecum); Sigmoid and Rectum; Hernia; Genito-Urinary Organs; External (Skin); Vascular System; Head; Central Nervous System; Neck; Thyroid; Thorax; Bones and Joints; Principles of Surgery; Travelogue; and Addresses.

The work of the Mayos is so well known and deeply appreciated that surgeons everywhere will appreciate the bringing together in these volumes of their earlier contributions to surgery.

INTERNATIONAL CLINICS. Volume II. Twenty-second series, 1912. A quarterly of illustrated clinical lectures and especially prepared original articles on treatment, medicine, surgery, neurology, pediatrics, obstetrics, gynaecology, orthopaedics, pathology, dermatology, opthalmology, otology, rhinology, laryngology, hygiene and other topics of interest to students and practitioners by leading members of the medical profession throughout the world. Edited by Henry W. Cattell, A. M., M. D., Philadelphia, with the collaboration of Wm. Osler, M. D., John H. Musser, M. D., A. McPhedran, M. D., Frank Billings, M. D., Chas. H. Mayo, M. D., Thos. H. Rotch, M. D., John G. Clark, M. D., James J. Walsh, M. D., J. W. Ballantyne, M. D., John Harold, M. D., and Richard Kretz, M. D. Octavo of 304 pages. Price, $2.00. Philadelphia and London: J. B. Lippincott Company, 1912.

Among numerous interesting articles in the present number of this well-known quarterly the special attention of our readers is invited to the following: The Management of Sunstroke—A Lesson in Hydrotherapy, by Simon Baruch, M.D.; Headaches and Tender Points in Diagnosis, by G. K. Dickinson, M.D.; Food—What It Is and What It Should Be, by W. O. Owen, M.D.; The Public Health Laboratory, by Herbert Fox, M.D.; and a Lecture on the Present Status of Epidemic Poliomyelitis, by Simon Flexner, M.D.

This number also contains a number of articles grouped under the heading "Symposium on Anaesthesia." These are all worthy of careful reading.

THE PLAN O' THE HOUSE O' MAN, SIR. By James Cabell Minor, Late Major and Surgeon, U. S. Volunteers, and Sanitary Inspector, Division of the Philippines, U. S. Army, etc. Octavo of 24 pages, illustrated. Price $1.00.

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The author, a well-known member of this Association, has written an original book. This is intended to teach the public generally how to preserve their health by due attention to their alimentary tract. Clever colored pictures show what takes place in the passage of the food from mouth to cecum.

Probably many of us will not wholly agree with all the author's hygienic rules, but none of us can doubt his earnest purpose to benefit humanity through popular teaching by means of this book.

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THE BALTIMORE MEETING

BALTIMORE, MARYLAND, OCTOBER 1-4, 1912.

SUPPLEMENTARY PROGRAM OF THE TWENTY-FIRST ANNUAL MEETING OF THE ASSOCIATION OF MILITARY SURGEONS OF THE UNITED STATES.

FURTHER and satisfactory progress has been made in the arrangements for the Baltimore Meeting since the publication of the last number of THE MILITARY SURGEON. As previously announced, headquarters for this meeting will be established in the Belvedere Hotel, where the registration office and information bureau will be located. Mail and telegrams intended for those in attendance at the meeting should be addressed in care of the "Registration Office, Association of Military Surgeons, Belvedere Hotel, Baltimore, Maryland." All members should register promptly at this office wherever they may elect to stay while in Baltimore. They should also secure the official program and other printed matter relating to the meeting at the information bureau. This is especially necessary in this instance as it is not anticipated that all meetings will be held at the established headquarters:

Foreign delegates nominated to date are as follows:

Argentine:

Dr. Juan G. Castillo, Sanitary Corps, Argentine Navy.

Canada:

Major E. J. Williams, Army Medical Corps,

Captain James H. McGarry, Army Medical Corps.

China:

Dr. T'ang Wen-yuan, Imperial Navy,

Dr. Hsu Shif-fang, Imperial Navy.

Denmark:

Acting Surgeon General A. C. Bornemann.

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Great Britain:

Lieutenant Colonel S. Hickson, M. B., Royal Army Medical Corps.

Guatemala:

Dr. Don Ramon Bengoechea.

Italy:

Major Carlo Maurizio Belli, Italian Navy,

Captain Meriggio Serrati, Italian Navy.

Mexico:

Dr. Eduardo R. Garcia.

It is understood that a number of additions to this list may be expected.

While a very large attendance of home delegates is anticipated, responses to invitations to the meeting sent out by the Association have been very slow in coming in. The regular establishments of the various public medical services will be represented as follows:

Army.—Colonel L. Mervin Maus, Lieutenant Colonel Jefferson R. Kean, Major Paul C. Hutton, Major Gideon McD. Van Poole.

Navy.—Surgeon-General C. F. Stokes, Medical Inspector George Pickrell, Surgeon L. W. Spratling, Surgeon R. M. Kennedy, Surgeon W. C. Braisted, Surgeon F. E. McCullough.

Public Health Service.—Assistant Surgeon General W. C. Rucker, Surgeon W. P. McIntosh, Surgeon C. P. Wertenbaker, Passed Assistant Surgeon A. J. McLaughlin.

A large number of other members have announced their intention of coming over from Washington. The following states have already announced that they will send representatives to Baltimore: Wisconsin, Pennsylvania, Connecticut, Kansas, New York and Ohio. Delegates will also probably be in attendance from Oregon and South Dakota. The only states which have announced that they will be unable to send delegates are Oklahoma, Washington and Texas.

Only a few states have sent the names of their delegates as yet. Those already received are as follows:

Montana.—Major W. C. Riddell, Captain W. S. Little, Lieutenant C. F. Junt.

Arizona.—Major H. Vance Clymer, Captain J. B. Nelson.

Massachusetts.—Major Frank P. Williams.

District of Columbia.—Lieutenant Colonel L. H. Reichelderfer.

Before the sessions begin, in accordance with the usual prac-

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tice, a meeting of the Executive Council will be held. This year this meeting will be at 8:00 p. m., Monday, September 30, in the Belvedere Hotel.

The first session will assemble at 9:30 a. m., October 1, 1912. This will probably also be at the Belvedere Hotel. It is for members of the Association only, and it is anticipated that most of the business will be concluded on this occasion.

Tuesday, October 1, 1912.

9.30 A. M.

Business Meeting.

(For members of the Association only.)

1. Report of Executive Council.
2. Report of Treasurer.
3. Report of Secretary and Editor.
4. Appointment of Auditing Committee.
5. Report of Literary Committee.
6. Appointment of Special Committees for the Meeting.
7. Report of Committee on Legislation.
8. Report of Necrology Committee.
9. Report of Committee on Arrangements.
10. Report of Special Committees.
11. Appointment of Nominating Committee.
12. Miscellaneous Business.

SECOND SESSION (AFTERNOON).

1. Election of Officers.

For this date the local Committee on Arrangements has also provided clinics at the Hopkins, University, Mercy and Maryland General Hospitals. At nine in the evening a reception will be tendered the President of the Association at the Belvedere Hotel.

Wednesday, October 2, 1912.

Professional Program Begins.

MILITARY HYGIENE.

Does the Moderate Use of Alcohol Reduce Health and Efficiency and Should the Use be Prohibited Among Officers and Officials of the Military and Civil Services? by Colonel Louis Mervin Maus, Medical Corps, U. S. A., Chief Surgeon, Eastern Division.

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The Ill-effects of Smoke on Health and Comfort, by Surgeon J. B. Stoner, P. H. S.

Co-operation Between Federal, Municipal and Naval Authorities in the Prevention of Venereal Disease, by Passed Assistant Surgeon G. B. Trible, U. S. N.

Some Remarks on the Construction and Use of the Kitchen Incinerator, by Lieutenant Colonel L. H. Reichelderfer, Medical Corps, N. G. D. C.

Gaseous Disinfection in the Field (illustrated with original apparatus), by Major Edward L. Munson, Medical Corps, U. S. A.

How May We Determine the Portability of Water in Temporary Camps, Marches and Maneuvers, by Captain Robert S. McCaughey, Medical Corps, N. G. Ill.

A Portable Screened Kitchen, by Major Charles S. Grant, Medical Corps, N. G. Iowa.

Hygiene of the Tropics, by Passed Assistant Surgeon F. A. Ashford, P. H. S.

The Influence of Camp Epidemics on the Geographical Expansion, Political History and Military Policy of the United States, by Major Edward L. Munson, Medical Corps, U. S. A.

Syphilis: Especially in Regard to Its Communication by Drinking Cups, Kissing, etc., by Surgeon W. P. McIntosh, P. H. S.

Venereal Disease in the United States Navy: Prevention and Prophylaxis, by Surgeon Robert E. Ledbetter, U. S. N.

The Sanitation of Guayaquil, by Passed Assistant Surgeon B. J. Lloyd, P. H. S.

Exclusion of the Mentally Unfit From the Military Services, by Assistant Surgeon R. F. Sheehan, Jr., U. S. N.

FOURTH SESSION, 9:00 P. M.

Public Meeting (general public invited).

This meeting will be followed by a smoker.

Thursday, October 3, 1912.

FIFTH SESSION.

Professional Program Continued.

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ORGANIZATION AND ADMINISTRATION.

Co-operation of the Public Health Service with the Navy in Time of Peace, by Surgeon F. E. McCullough, U. S. N.

Training of Medical Officers of the Organized Militia for Service in the Navy, by Surgeon R. M. Kennedy, U. S. N.

Sanitary Troops in the Organized Militia, 1911 and 1912, by Captain Henry D. Thomason, Medical Corps, U. S. A., Division of Militia Affairs.

Reports of General Instructions and Maneuvers at Mt. Gretna and Gettysburg, by Captain Robert F. Trainer, Medical Corps, N. G. Pa., and Captain Henry F. Doan, Medical Corps, N. G. Pa.

Problems of the National Guard Regimental Surgeon in a Maneuver Campaign, by Major Carl Phillips, Medical Corps, N. G. Kans.

A Tour of Military Duty at Fort Riley and Its Lessons, by First Lieutenant B. M. Linnell, Medical Corps, N. G. Ill.

Camp Sanitation and Joint Maneuver Camps of 1912, by Captain Henry D. Thomason, Medical Corps, U. S. A., Division of Militia Affairs.

The Adaptation of the Paper Work of the Organized Militia to That of the Medical Department of the Army, by Major George S. Crampton, Medical Corps, N. G. Pa.

This session will be held on the boat during a trip from Baltimore to Annapolis. The boat will leave the dock at 9:00 a. m., on Thursday. On arrival at Annapolis visits will be made to the Governor of Maryland and to the Naval Academy.

Friday, October 4, 1912.

SIXTH SESSION.

9:30 A. M.

Professional Program Continued.

MILITARY MEDICINE.

Recent Advances in Medicine and Surgery in the Navy, by Surgeon A. W. Dunbar, U. S. N.

Notes on Graduated Labor in Pulmonary Tuberculosis, by Surgeon R. C. Holcomb, U. S. N.

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MILITARY SURGERY.

Brain Abscess as a Remote Effect of Gun-Shot Wounds of the Head, by Major William Jepson, Medical Corps, N. G. Iowa.

A Proposed Plan of Treatment of Gunshot Wounds of the Abdomen on the Battlefield by Anatomical and Physiological Test, by Captain Allie W. Williams, Medical Corps, U. S. A.

The Operative Treatment of Fractures, by Captain George H. Parmerlee, Medical Corps, N. G. Mich.

A Portable Positive Pressure Apparatus for Administration of Ether by Ultra-Tracheal Insufflation (Exhibit of apparatus and paper), by Captain Allie W. Williams, Medical Corps, U. S. A.

Major C. S. Young, Medical Corps, N. G. Illinois, and other officers will also read papers. The titles will be announced later.

BUSINESS SESSION.

1. Report of Auditing Committee.
2. Unfinished Business.

On the afternoon of this day the ladies in attendance at the meeting will be given an automobile ride to Green Spring Valley, and in the evening at 9:00 p. m. an officers' ball will be held at the Fourth Regiment Armory.

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EDITORIAL

THE recent publication of regulations governing voluntary aid in the Navy, and later the appearance of similar regulations for the Army represent the first serious attempt by our government to put this factor of our military preparation for war on the plane which it has long since attained in nearly all other nations. China and ourselves, as a matter of fact, were, previous to the publication of the regulations in question, practically the only countries which have neglected this important subject. The modern army in China, as everyone knows, is of very recent growth. Certainly as soon as conditions become more settled there, if that country continues to follow its present military models, this subject will receive attention as a part of the scheme for a well-organized army.

It has been urged that in every country, the government is under obligation, itself, to provide for all the needs of its sick and wounded soldiers and sailors in war. This ideal condition is one which no government has yet attempted to fulfill, however. So enormous are the demands of modern warfare that medical corps are not maintained so as to be capable of expansion to meet all such demands in personnel and material. Moreover, it is generally believed that the military interests of nations are greatly promoted through giving citizens generally the opportunity to display their patriotism by helping to provide for the needs of sick and wounded soldiers and sailors representing them at the front. Without doubt, patriotism becomes stronger when it is permitted participation in the concerns of soldiers and sailors armed in the defense of a country. Further, history shows that in war it cannot be bottled up and the attempt to do so will result not in its flow going to swell the current which may be turned here and there as necessity arises for the benefit of the military, but in many dribbling streams without direction, far too profuse here and absolutely wanting there.

It is certainly worthy of note that in those countries whose armies and navies are generally regarded as best prepared for

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war, the greatest interest has been manifested in plans for utilizing voluntary aid. So much study has been devoted to this subject, that it might be thought some unanimity of opinion would have been reached. This is by no means the case, however, though three facts seem to have been pretty clearly established. These are that voluntary aid personnel should not work independently but should become a part of the medical corps of the army or navy under competent direction just as does the other personnel which goes to make up these corps: that voluntary aid personnel should not be found at the front except under abnormal conditions and that sick and wounded soliders and sailors should not be turned over to volunteer aid organizations for final disposition. The reasons for these conclusions are not far to seek. Independent organizations produce an intolerable confusion and work at cross purposes; for service at the front long military training and subordination are required which are not likely to be found in voluntary aid personnel; and allotting soldier and sailor patients to voluntary aid organizations is likely to result in unwarranted loss to the military forces, as with the former the humanitarian must naturally prevail over military necessities. Further, it is generally agreed that voluntary aid personnel, to be truly efficient, must receive training in peace which will enable it in war to fit into the army or navy, as the case may be, and that material must be collected with the same object in view. Therefore a system of inspection by officers of the medical department in peace has generally been regarded as essential.

Judging from the conditions which now exist in the armies of different countries there is the greatest diversity of opinion what directions voluntary aid should take in war. Some of them devote all their attention to securing a trained voluntary aid personnel while in others, on the contrary, material alone receives consideration. Yet, it would seem as though it would not be such a difficult matter to determine just where the medical department of any army or navy would be likely to be most lacking in war, and then to bend all energies to meet this lack through a voluntary aid organization. It must be remembered, however, that where an army or navy is wanting is likely to be

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in a direction which makes little popular appeal. If this is not strong enough to affect the government concerned, it is unlikely to command a very vital interest from a voluntary aid organization which is dependent for its very existence on popular approval. This has little force and effect in probably one country, perhaps in one other nation and possibly in still another; but generally speaking it is absolutely correct. This being the case, in the majority of nations, voluntary aid organizations must be given a certain amount of latitude in what they shall provide. Aside from this, conditions in different countries also differ widely; in some a trained voluntary aid personnel, though it may not always be of the same class, is regarded as essential, in others preference is given to material, trained personnel of every class being provided by the medical corps from reservists and otherwise.

It would be most humiliating to confess that we, as a nation, are not as susceptible to humanitarian impulses as are other peoples, and this is most distinctly not the case. We respond generously to every appeal of suffering humanity and in war the needs of our soldiers and sailors have always been generously met. Where we differ from many other nations, however, is that we are not so constituted that we can believe in the possibility of war until hostile shots are actually exchanged. Moreover, no nation in which everyone does not serve in peace through conscription can be expected to take the same amount of interest in army and navy until war actually comes when fathers, brothers and sons will be found at the front. Even with practically everyone serving, nations with conscript armies and navies find it difficult to maintain interest in voluntary aid organizations unless they play a prominent part in the national life in peace. Our own Red Cross has done this of late years and this is where its strength has been. So thoroughly does it command the confidence of the public that if war should unfortunately come money would flow into its coffers in vast streams. Even at this late date there is no question but that this money could be made of the greatest use. It is certain that it would not be frittered away, and every dollar will be needed in a serious war.

Aside from this question of money, new obligations have been imposed on our voluntary aid organization by the new regulations

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of the Army and Navy. As with other nations, and perhaps on account of our peculiar conditions more than in any other country, these can only be met by creating something which will be essential from the humanitarian standpoint in peace and which may be utilized if war should come.

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NEWS OF THE SERVICES

Surgeon General George H. Torney, who has been inspecting Military Prisons as a member of a board, returned to Washington on the 15th instant. General Torney's trip extended to the Pacific Coast.

The resignation of Captain Robert L. Richards, Medical Corps, has been accepted.

Captain William Little and Captain Allie W. Williams of the Medical Corps have been in Washington on official business.

Orders have been issued for the members of the new class at the Army Medical School to report to the Commandant of the School for duty on September 20th. The course of instruction will be commenced on October 1st. Twenty-two candidates have been approved and a large class was examined in September. The reports of the Examining Boards have not yet been completed, but it is probable that a considerable number of candidates will be approved and added to the twenty-two. A list of approved candidates follows:

Bliss, Raymond Whitcomb.
Chappell, Sidney L.
Duckwall, Bertram F.
Saurman, John Shelley.
Borden, William Benjamin.
Wagner, Paul Stanislaus.
Herbert, William D.
Wilbor, Leon Mitchell.
Fielden, J. S. C., Jr.
Kirk, Norman.
McFarland, Fletcher O.
Duenner, Robert Henry.
McCulloch, Earnest Chester.
Kinsey, Oliver, Jr.
Guinan, Edward Robert.
Smith, Stephen Harrison.
Lull, George Fairless.
Warriner, Benj. B.
Harris, Halbert Porter.
Bell, Clarence H.
Cummings, Royal E.
Weidner, E. T. B.

The following-named officers of the Medical Corps have been designated as delegates to attend to the Baltimore meeting of the Association of Military Surgeons:

Col. Louis M. Maus.
Lieut. Col. Jefferson R. Kean.
Major Paul C. Hutton.
Major Gideon McD. Van Poole.

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Major Bailey K. Ashford, Medical Corps, from San Juan, Porto Rico, is in Washington in attendance on the Congress of Hygiene and Demography.

Colonel L. A. LaGarde, Medical Corps, will be relieved at the Army Medical School by Colonel Charles Richard. On being relieved, Colonel LaGarde will report to the Surgeon General for duty in his office.

Col. Henry P. Birmingham, Medical Corps, has been ordered to command the Walter Reed General Hospital.

Captain Clarence E. Fronk, Medical Corps, on leave from Fort Benjamin Harrison, Indiana, was recently a visitor in Washington.

The following civilians have recently passed successful examinations for appointment as acting assistant surgeon in the United States Navy and have been assigned to recruiting duty:

Dr. J. E. Heatley, Hiawatha, Kan.
Dr. J. V. Reed, Jeffersonville, Ind.
Dr. F. B. Cochran, Omaha, Nebr.
Dr. W. G. Townsend, Baltimore, Md.
Dr. R. W. Mendelson, Kansas City, Mo.
Dr. C. K. Miller, New York City.

Surgeon Joseph A. Murphy, who has been in charge of physical training at the Naval Academy for the past three years, will be assigned to different stations to introduce the system throughout the service. His first detail will be to the Great Lakes Training Station at Chicago, Ill.

Surgeon E. J. Grow, U. S. N., and P. A. Surgeon H. W. Smith, U. S. N., are members of a board investigating the lighting of certain buildings of the Naval Academy.

Assistant Surgeon E. M. Brown, U. S. N., is engaged in an exhaustive investigation of atmospheric conditions in submarines.

The device adopted for the recently authorized Dental Corps of the United States Navy is composed of an oak leaf with two acorns at its base, a modification of the same motif used by the Medical Corps of the Navy.

P. A. Surgeon J. O. Downey, U. S. N., was detailed as officer in charge of the Alaskan Coal Investigating Expedition, the members of which left Seattle, Wash., recently. This expedition will be quartered in the Alaskan coal fields during the coming winter and the following summer. They will prospect various parts of the coal fields and will bring a quantity of coal to the seacoast. This coal will be tested practically by the Navy for use aboard vessels of this service.

HEADQUARTERS INDIANA NATIONAL GUARD,
Office Adjutant-General Brigade,
INDIANAPOLIS, July 10, 1912.

SPECIAL ORDERS, No. 89, 1912.

Extract.

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5. Capt. John W. Sluss, Medical Corps, commission dating from May 8, 1912, is re-attached to 1st Infantry.

6. 1st Lieut. George F. Holland, commission dating from July 6, 1912, is assigned to Field Hospital No. 1, and will report in person to Commanding Officer on the 15th inst.

7. 1st Lieut. N. Austin Carey, commission dating from July 5, 1912, is, pending further orders, attached to Signal Company, and will report to Commanding Officer in person on the 15th inst. at Fort Benjamin Harrison for duty.

* * * * * *

By Command of Brig. Genl. McKee.

(Sgn.) WALTER O. BRAGG,
Major, Brigade Adjutant.

STATE OF INDIANA,
Adjutant General's Office,
INDIANAPOLIS, Aug. 8th, 1912.

SPECIAL ORDERS, No. 34.

1. Upon his own request, Major Eugene Hawkins, Medical Corps, is placed upon the Indiana National Guard retired list, pursuant to Section 67 of the Acts of the General Assembly, approved March 5th, 1895.

SERVICE:

1st Lieut. & Asst. Surg.	8th Feb., '92
Capt. & Asst. Surg.	8th Feb., '92
Capt. & Asst. Surg., 159th Ind.	4th May, '98
Hon. must. out	23rd Nov., '98
Maj. Surg.	7th Jul., '00
Retired	8th Aug., '12

By order of the Governor.

(Sgn.) GEO. W. MCCOY,
The Adjutant-General.

HEADQUARTERS INDIANA NATIONAL GUARD,
Office Brigade Adjutant,
INDIANAPOLIS, August 14, 1912.

SPECIAL ORDERS, No. 106, 1912.

Extract

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3. Major William R. Davidson, M. C., is relieved from duty with the 3d Infantry and assigned to the 1st Infantry.

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By Command of Brig. Genl. McKee.

(Sgn.) WALTER O. BRAGG,
Major, Brigade Adjutant.

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HEADQUARTERS INDIANA NATIONAL GUARD,
Office Brigade Adjutant,
INDIANAPOLIS, August 14, 1912.

SPECIAL ORDERS, No. 106, 1912.

Extract

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4. Major Larue D. Carter, M. C., is relieved from duty with the Field Hospital and assigned to the 3d Infantry.

5. Major John J. Boaz, M. C., commission dating from August 8, 1912, is assigned to command of Field Hospital No. 1, stationed at Indianapolis.

By Command of Brig. Genl. McKee.

(Sgn.) WALTER O. BRAGG,
Major, Brigade Adjutant.

Later advices from the Indiana National Guard show that Captain Charles B. Gutelius, Medical Corps, has been placed on the retired list.

Professor Dr. H. Strauss of Berlin will lecture at the New York Post-Graduate Medical School and Hospital, Second Avenue and Twentieth Street, on October 12th, 14th and 15th, on the Diseases of the Stomach and Kidney. Professor Dr. Carl von Noorden, Physician-in-Chief to the City Hospital, Frankford, Germany, will also deliver a series of lectures on the Pathology and Treatment of Diabetes, Radium Therapy and Arteriosclerosis at the same place, on October 28th to October 31st, inclusive.

GENERAL ORDERS, No. 26. WAR DEPARTMENT, WASHINGTON, August 16, 1912.

I. With a view to increasing the marching capacity of troops. company commanders will personally measure the feet and fit the shoes of men of their commands and will be held responsible that the instructions herein contained are strictly followed.

All measurements prescribed herein will be taken with the soldier standing in bare feet and with a 40-pound burden on his back, bearing the entire weight upon the foot to be measured. Balance may be preserved by resting the hand on a fixed object. The measurements of the foot, which must be taken to make suitable preliminary selection of the shoe to try on, are (a), the length; (b), the circumference around the ball.

To measure the length the soldier will stand with foot upon the foot measure, furnished by the Quartermaster's Department, fitted in a slot in a board, the heel of the soldier fitting snugly against the heel block. The movable block will then be pushed up until it touches the end of the great toe. The scale on the top of the measure, which is graduated in sizes, will then be read, and the proper length of the shoe will be determined, approximately, by adding 2 to the reading of the scale; thus, if the soldier's foot scales 6½, a shoe not smaller than 8½ should be tried on first.

To take the ball measure, pass the foot tape, supplied by the Quartermaster's Department, around the foot at the prominent tubercle at the

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base of the great toe and the prominent tubercle at the base of the little toe.

* * * * * *

The tape should lie closely to the flesh, but should not be so tight as to compress it. Having taken the foregoing measurements, the shoe best suited to the foot will be determined by reference to Circular No. 10, Quartermaster General's Office, April 6, 1912. For example, assume that the circumference of the ball is found to be 9¼ inches. In the table on page 28 of the aforesaid circular, under the heading "Marching shoes," it will be seen that for a foot requiring an 8½ shoe a ball measurement of 9¼ inches corresponds to a D width. The size of shoe to try on for actual fitting is, then, in this case, 8½ D.

If the ball measurement found as above does not correspond exactly with any ball measurement given in the table, then the narrower of the two widths between which the measurement lies should be selected.

Beginning with the size and width thus tentatively selected, shoes will be tried on until a satisfactory fit is secured. Correct fit in waist and instep will be determined experimentally. To determine the fact of fit the shoe will be laced snugly and the soldier with a 40-pound burden upon his back will again throw his entire weight on one foot. The officer will then press in the leather of the shoe in front of the toes to determine the existence of sufficient vacant space in that region to prevent toe injury. Under no circumstances should this vacant space in front of the great toe be less than two-thirds inch; nor should there be pressure on the top of the toes. The officer will then grasp with his hand the leather of the shoe over the ball. As his fingers and thumb are brought slowly together over the leather, the shoe should feel snugly filled without apparent tension, while the leather should lie smoothly under the hand. If the leather wrinkles under the grasp of the hand, the shoe is too wide and a narrower width is needed; if the leather seems tense and bulging and the hand tends to slip over easily, the shoe is too narrow and a greater width is necessary.

It may be necessary to try on several pairs of shoes in this manner before an entirely satisfactory shoe is secured. A record of the proper size and width of shoes as determined above will be kept as provided in Circular No. 10, Quartermaster General's Office, April 6, 1912.

Measurements will be taken and shoes will be fitted as prescribed at least once in each enlistment and the record will be changed from time to time if subsequent fittings render a change necessary.

Sizes called for in requisitions will conform to the record and the fact of fit of shoes issued on such requisitions will be personally verified in every instance by company commanders in the manner above prescribed.

No shoes will be issued to, or worn by, enlisted men while on duty which are not fitted in accordance with this order.

New shoes should be adapted to the contours of the feet as soon as possible. Shoe stretchers, with adjustable knobs, to take pressure off painful corns and bunions, are issued by the Quartermaster's Department.

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All shoes should be properly broken in before beginning a march, but if this is impracticable, then the following is suggested but not required:

The soldier stands in his new shoes in about 2½ inches of water for about five minutes until the leather is thoroughly pliable and moist; he should then walk for about an hour on a level surface, letting the shoes dry on his feet, to the irregularities of which the leather is thus molded in the same way as it was previously molded over the shoe last. On taking the shoes off a very little neat's-foot oil should be rubbed into the leather to prevent its hardening and cracking.

If it is desired to water-proof the shoes at any time, a considerable amount of neat's-foot oil should be rubbed into the leather.

Light woolen or heavy woolen socks will habitually be worn for marching; the socks will be large enough to permit free movement of the toes, but not so loose as to permit of wrinkling. Darned socks, or socks with holes, will not be worn in marching.

Company commanders, by frequent inspections throughout the year, will maintain the feet of their men in condition for proper marching. They will cause the proper trimming of nails, removal or paring of corns and callouses, relief of painful bunions, treatment of ingrowing nails, and other defects, sending serious cases to the surgeon.

Before a march is undertaken by foot troops company commanders will personally inspect the bare feet of their men. While on the march they will personally see each day that their men wash their feet as soon as possible after reaching camp, prick and evacuate blisters, and cover such blisters or excoriations with zinc oxide plaster, supplied by the Medical Department, applied hot, dust the feet with the foot powder supplied by the Medical Department, and put on clean socks. Hereafter, an undue amount of foot injury and disability from shoes will be regarded as evidence of inefficiency on the part of the officers concerned and as causes for investigation.

Post quartermasters will provide a place in the quartermaster's storehouse where shoes may be fitted for the purpose of determining or verifying the record required by General Orders, No. 48, War Department, 1911. For the purpose of fitting they will keep on hand at all times a complete series of each size and width of shoes furnished for issue. Shoes of this series will be put in stock and issued before they become unserviceable, and will be replaced by new shoes, keeping the series always complete. Company commanders will report in writing to the post commander every instance of failure to secure proper shoes for their commands or to obtain proper facilities for fitting the shoes as herein directed. Post commanders will investigate the reasons for and be held responsible as far as lies in their power for the rectification of such deficiencies.

A brief record of the number of such reports from company commanders and the reason for such deficiencies will be furnished to inspectors at each inspection of the post.

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Inspections conducted under the provisions of paragraph 913, Army Regulations, will embrace an inquiry into the manner in which this order has been complied with, and the report of inspections will include a statement of all instances of failure on the part of company commanders to secure proper shoes for their commands and the cause of such failure.

II. A new pattern shoe has been adopted for the service which, when the old stock shall have been exhausted, will supersede the different patterns now on hand in the Quartermaster's Department. Hereafter, until the old supply is exhausted, requisitions for shoes will be filled from stock on hand, irrespective of pattern or finish.

By order of the Secretary of War:

LEONARD WOOD,
Major General, Chief of Staff.

Official:

(Sgn.) GEO. ANDREWS,
Adjutant General.

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The Military Surgeon

Vol. XXXI. NOVEMBER, 1912 No. 5

ORIGINAL ARTICLES.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS EXPRESSED IN THEIR CONTRIBUTIONS.

THE PRESIDENT'S ANNUAL ADDRESS.*

The Sanitary Awakening of a Nation.

By Surgeon CHARLES P. WERTENBAKER, United States Public Health Service.

Mr. Chairman, Members and Delegates of the Association of Military Surgeons, Ladies and Gentlemen:

OF all the varied activities that have marked the opening years of the 20th century, none has made a more profound impression upon the people of this country than the great sanitary movement that is now sweeping over the land.

It may be that we are today spectators at the beginning of one of the most important periods of history, and are standing on the threshold of an epoch that may change the standards of mankind, and establish new limits for human achievement.

It is also possible that this period may mark the dawn of a new civilization, wherein the conservation of the health of the individual is a basic principle; a civilization that recognizes that the highest development of the race depends upon the health of its members, and that progress in science, the arts, commercial achievement, and other fields of activity, is limited by the physical capabilities of its people.

*Delivered at Baltimore, Md., October 2, 1912.

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The most casual observer of passing events can not have failed to note the great and increasing interest that is being now displayed by the people of this country in health matters. In every city, town and hamlet, and even in the loneliest cabin in the remotest mountain districts, or by the restless sea, is felt the stirring of this new gospel—the gospel of health and sanitation.

What the results of this great movement will be no man can fully predict. That its effects upon the nation will be profound there seems to be no question, but who will attempt to mark the confines of its effectiveness, or prescribe the boundaries of its influence?

The health of the individual is one of the active forces of our national life. Without it all the best gifts of the Gods are but hollow mockeries. The health of a nation (which is but the aggregate of the health of the individuals composing it) determines the part that nation will play in the world's history; it circumscribes the sphere of its activity, and sets the limits of its achievements. On it depends the fate of armies and of peoples. It rearranges the map of the world, and is a potential factor in the progress of civilization.

An object of such importance is worthy of our closest study. To save a great nation from the devastating effects of disease; to beat back the grim hand of death; to lift the shadow of sickness and sorrow, and substitute therefor, health and strength and happiness; to thus aid in the upbuilding of a people, so that the powers of body and mind are capable of the highest development and greatest achievement; such an aim is calculated to stir the ambition of the dullest soul, and arouse to action the most sluggish mind.

Time will not permit me tonight to trace the origin of this great sanitary movement, nor follow the course of the various factors that have contributed to bring it to its present state of development. I will, however, attempt to point out some of the relations to this movement, of the organizations composing this Association, and indicate some of the lines along which it is probable that the development of sanitary progress will proceed.

This Association may justly claim its share in this work, for it has been instrumental in helping to bring these medical depart-

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ments of the government and the National Guard to their present state of efficiency.

This is the 21st annual meeting of the Association, which may now be said to have reached a vigorous manhood. Throughout these years the various problems that have confronted the military medical officer have been discussed at these meetings, and in the pages of THE MILITARY SURGEON, the official journal of the Association, and these discussions have been of great benefit to its members.

It is also due to the efforts of this Association that many foreign governments, responding to the invitation extended by the Department of State, have sent some of their most brilliant medical officers to represent them at these meetings. These officers have brought with them the wisdom that comes from profound study of their profession, and a ripe experience culled from every country on the globe, all of which they have freely placed at our disposal to aid us in solving our own problems, and helping us to increase our efficiency.

To these foreign representatives we wish to acknowledge our deep indebtedness, not only for the value of the material that they have brought us, but also for the manner of its presentation.

We have with us tonight distinguished representatives from Canada, China, Denmark, France, Great Britain, Guatemala, Italy and Russia.

I welcome them on behalf of the Association with feelings of sincerest pleasure. We are glad to see each of them, and we feel honored by their presence. We invite them to join freely in our professional discussions, and to partake of all the entertainments that have been provided for our pleasure.

We wish them to feel that they are not "strangers in a strange land," but that they are united to us by those ties that bind our profession together throughout the world, and we regard them as brother officers engaged in a high and noble cause, and, as such, we welcome them to our hearts and homes.

In discussing the public health activities of the medical departments of the Army, Navy and National Guard, it must be remembered that the officers of these corps are primarily specialists in military and naval surgery and sanitation. Their function is to

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keep the fighting unit at its highest state of efficiency, and what they have done has resulted in the prevention of sickness among their respective military forces, and guaranteed to the country that in war disease shall no longer be more deadly than bullets.

In a broad sense each of these medical departments contributes also to the health education of the country, because they train the man under their care in the principles and practice of hygiene in order to preserve their health.

These lessons are seldom forgotten, and though many of them leave the Service and return to civil life, this knowledge remains with them as an active force, and exercises a beneficial influence on them, and the people with whom they associate. Thus each of these Services is a school for sanitary instruction, not only for the personnel of that Service, but through them the general public.

I will not attempt to enumerate all that has been done by these medical departments in the cause of public health, but I wish to mention some of their work in this connection.

The medical officers of the National Guard, almost without exception, are practitioners of medicine and surgery in civil life whose military duties are in addition to their civilian work. Often their military duty involves loss of time and money to them, but such is their patriotism and love for their Service that they cheerfully give the best they have to the military cause of their state and their country.

These are the men upon whom the country must rely to furnish the bulk of the medical officers in time of war, as they have done in the past. In every war in which this country has engaged, thousands of medical men have left their homes and practices to serve the country as military and naval medical officers, and many of them have written their names high on the scroll of Fame. But it is not on the field of battle, or in the midst of war that their best work is done. Valuable as have been their services in time of war, it is in the less spectacular walks of daily life, while ministering to the sick and suffering, guarding them from disease, and teaching them the lessons of sanitation and preventive medicine, that they have earned their crown.

Without ostentation, and often in the face of opposition involving loss of practice, they have fought the battles for the people,

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and labored to save them from the results of ignorance and indifference to health measures.

What these men have done for the public health will never be known, or sufficiently appreciated. It may be that to "fame and fortune" many of them are yet unknown, but better, they are enshrined in the hearts of their patients, and honored in the communities where they live, best loved by those who know them best. Ever ready to respond to the call of duty, be that duty what it may, they represent the highest type of American manhood, and we honor ourselves when we honor the citizen soldiery of the United States.

The duties of the medical officers of our Navy keep them so much afloat, and scattered over many seas, that they have less opportunity than any of the other members of this Association to come in contact with the people throughout the country. The medical corps of the Navy does, however, exert a strong influence for the betterment of health conditions, especially in cities on the coast.

Where a large number of men are kept in a confined space, as in a modern war vessel, it is necessary that every precaution be taken to maintain the sanitary conditions at their best. The presence of a case of infectious disease on such a vessel is of greater importance than a similar case ashore, therefore the health conditions in the cities to which the men are exposed when given shore liberty becomes a matter of great importance to naval medical officers. There is more than one city on our seaboard that has had its municipal conscience quickened, and has bestirred itself mightily to improve its sanitary conditions because the medical officers of the Navy objected to giving the men liberty where those conditions were not satisfactory.

Not only in this way have they tended to improve the public health, but also their work of venereal prophylaxis has done much toward suppressing preventable disease in our cities, as well as in the Navy. Some of the papers to be read at this meeting will show what this work has been, and its value to the public. Typhoid inoculation of the officers and men of the Navy has been of value in protecting the public also.

The contributions of Naval medical officers to our knowledge of tropical and other diseases have been numerous and valuable,

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and their work in the other branches of the profession have been abreast of the times. The corps has made marked advances in the last decade, and I predict that it will add many new laurels to the wreath that it now so modestly and gracefully wears.

Though chiefly engaged with its own problems, the medical corps of the Army has found time to render inestimable service to the cause of public health. Had this corps never done anything else for this cause, the work of Reed, Lazear, and Agramonte in demonstrating the mosquito transmission of yellow fever would make its fame secure in the annals of preventive medicine.

The work of sanitating the Canal Zone, under the direction of Colonel William C. Gorgas, of the Army Medical Corps, and at one time First Vice-president of this Association, has set a new standard for sanitary work in the tropics, and demonstrated the position that should be occupied by the sanitarian in the great enterprises of the world. The development of camp sanitation since the Spanish-American War has been marked, and the ratio of disease in camps has been greatly reduced thereby. The sanitation of territory occupied by troops, and the health lessons learned by the inhabitants therefrom, have been of much benefit to the public health of those sections.

The adoption and development of typhoid inoculation among troops have been of great value not only to the Army, but also in preventing the spread of the disease among civilians. In the fields of investigation and tropical medicine the Army medical corps is doing most excellent work, and its contributions to all branches of medicine are notable. The country is deeply indebted to the Army medical corps for its work, and looks upon its achievements with pride.

I now come to speak of the United States Public Health Service, through which this government exercises its public health functions.

This is the oldest medical service under this government, having been established in 1798 under the name of Marine Hospital Service, and until about 1878 its chief function was the care and treatment of seamen of the merchant marine, but from time to time Congress assigned to it numerous other duties, increased

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its public health functions, changed its name to Public Health and Marine-Hospital Service, and finally to Public Health Service, making it in name what it had long been in fact, the federal health agency.

As the Public Health Service it is naturally more closely connected with this sanitary movement than the other organizations of this Association.

I will not attempt to mention all of its numerous activities, but will only invite your attention to some special features of its public health work.

This service conducts all of the national quarantines of the United States, and also those of Porto Rico, the Hawaiian Islands, the Philippines, and the Canal Zone. It is also charged with executing interstate quarantine laws and regulations.

It conducts the physical examination of all aliens entering the United States or its possessions, in accordance with the immigration laws, and these examinations number over a million annually. The number of cases rejected for trachoma, favus, tuberculosis and other diseases, as well as persons mentally or physically unfit, will run into the thousands. The value to the country in excluding this vast number of diseased and defective persons is great from an economic as well as a public health standpoint.

The service has officers stationed in various foreign ports, attached to the United States Consulate, and with the consul they sign bills of health for vessels bound for the United States or its possessions. They also inspect all emigrants who embark at those ports for these countries.

These officers note the health conditions of the countries where they are stationed, and the appearance of quarantinable disease is promptly reported by cable to the Public Health Service. This information is transmitted to quarantine officers for their guidance in inspecting vessels. Thus it is seen that the United States, through the Public Health Service, assisted by the consular service, is kept informed of health conditions over the entire world.

The service co-operates with state and local health authorities for the suppression of epidemics and the improvement of health conditions. By means of an annual conference the service and state health officers are kept in touch, and methods for co-operation and mutual assistance are formulated and carried out.

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The service also operates the Hygienic Laboratory, located in the city of Washington, where problems relating to public health are investigated in the divisions of Bacteriology, Pathology, Zoology, Chemistry and Pharmacology, and bulletins giving the results of these investigations are frequently issued. Some of the world's best work along these lines is being done in this laboratory.

The service devotes much time to the study of broad sanitary problems, and has thrown new light upon conditions that are a menace to the health of large sections of the country. The investigations in regard to pollution of lakes and streams of the United States give promise for great improvement in these conditions, and Congress has directed that this work be continued.

The studies of the service in regard to typhoid fever, typhus fever, infantile paralysis, cerebro-spinal meningitis, pellagra, rabies, hookworm disease, milk infection, infant mortality, measles, plague, and other diseases constitute some of our latest and most thorough knowledge of these subjects.

The investigations by the service of Rocky Mountain (spotted) fever recently led to the death of Passed Assistant Surgeon Thomas B. McClintic of the Public Health Service, who became infected while studying the disease in the Bitter Root Valley in Montana, and died August 13, 1912, another victim who sacrificed his life on the altar of preventive medicine.

The death of this brilliant and much-loved young officer illustrates some of the dangers to which officers of the Public Health Service are exposed in the performance of their duties, and adds another name to the already long list of officers of that service who have died of disease contracted in the line of duty.

One of the features of the work of the service is the distribution of information among health officers and the general public regarding disease, sanitation and preventive medicine. By addresses before medical, scientific and other associations, and through articles published in medical journals, magazines and newspapers, as well as through the public health reports, and special bulletins, the service is constantly endeavoring to stimulate the interest and broaden the knowledge of the medical profession and the general public on these subjects.

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The work of the service in combating bubonic plague, and the discovery by it that the ground squirrel is the reservoir from which rats and other rodents become infected, thus keeping alive the infection, has led to new measures for the suppression of plague.

It was only a few years ago that this service, aided by the splendid co-operation of the citizens of New Orleans, performed a feat that had never before been accomplished in the history of the world,—the suppression of a widespread epidemic of yellow fever two months before the appearance of frost. This was done by destruction of the stegomyia mosquito, thus demonstrating, not only that yellow fever can be controlled by these measures, but also that the mosquito can be eliminated in the most unpromising surroundings.

Last year when this country was threatened with an invasion of cholera, the service inaugurated the practice of making a bacteriological examination of the discharges of each arriving passenger from the infected districts, thus determining with scientific accuracy if the individual was infected with cholera. By this means the period of quarantine detention was reduced several days, and when the passenger was released, it was with the knowledge that he was not a carrier of the disease.

These were the most extensive anti-cholera measures ever undertaken, based on scientific knowledge. This great work was carried on quietly and without publicity, and the people of this country do not realize the danger that threatened them from cholera, and from which they were saved by the Public Health Service.

Instances like these could be multiplied to show what the Public Health Service is doing for the country, but I will not tax your patience by a further recital of them. I trust that I have said enough to indicate the relation of the service to the public health of the country; to show that it is the sanitary army of the United States, ever guarding our borders against the invasion of infection from without; warring against disease and insanitary conditions within the country; endeavoring to extend sanitary education and the principles of preventive medicine to all the people.

This résumé of some of the activities of the organizations composing the membership of this Association serves to indicate in a

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measure the position they occupy in relation to this sanitary movement. Surely the Association has cause to regard with pride and pleasure the achievements of its members.

The lines along which this movement will develop, and the measures necessary to bring it to the highest state of efficiency, are matters of much interest.

As I see the situation the following aims must be accomplished:

1. Broader and more general education in health matters, and a more thorough understanding of their relations to the daily life of the individual, so that proper measures for the preservation of health may be appreciated.
2. Closer relations between the health agencies of the states and the nation, and with the people, so that the enforcement of sanitary laws and regulations may receive popular support.
3. The scientific training of health officers, and the establishment of a standard to be reached as a prerequisite to holding the position of health officer.
4. More extended and thorough instruction in sanitary science and public health work in our medical schools, and the establishment of courses leading to the degree of Doctor of Public Health.
5. Instruction in sanitation and the preservation of health in our public schools, commencing with the kindergarten classes and being carried through every grade of the public school course.
6. To enlist the co-operation of great business enterprises such as railroads, manufacturing establishments, and other commercial organizations in health work from an economic and financial standpoint, and to demonstrate that the conservation of the health of employees means more efficient work and greater financial returns.
7. The development and practical application of rural sanitation.

The key to the entire situation is *education;* education for the layman, and education for the medical profession.

The possesion of a medical degree as now constituted does not make a sanitarian any more than it makes a specialist in any other line. It is merely the foundation upon which to build special instruction and training.

It requires a high degree of intelligence, training and executive ability to cope with the many problems that confront the health officer. These concern not only the health of the community but

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often affect commercial interests, and it sometimes requires nice discrimination, broad information and sound judgment to decide between injury to business and injury to the public health.

The public health is a trust too sacred to place in any but skilled and competent hands, and the people have a right to demand that their health officials shall bring to the work such knowledge and training as will produce effective results.

The value of such knowledge and training is being recognized, and a number of states and cities have requested the services of officers of the Public Health Service to co-operate with their health departments.

From several foreign governments have come requests for officers to direct the work of sanitation in those countries, appreciating the fact that improved health conditions mean greater prosperity and closer commercial relations with this country.

The development of sanitary science has been so rapid in recent years that the schools have not kept pace with it, and until recently but few, if any of them, included instruction in preventive medicine in their curriculums.

I understand now that several of the leading medical colleges have established such courses, and in time we may hope that such instruction will form a part of every physician's education.

However much this may promise for the future it fails to reach the thousands of health officers now in this country who can not attend the colleges to obtain this instruction.

What is needed is a post-graduate school where a health officer who has only a few weeks to spare can get the latest information, and learn modern methods of dealing with sanitary problems and be stimulated by contact with scientific workers along these lines.

I believe the establishment of a school of Sanitary Science in connection with the Hygienic Laboratory of the Public Health Service, where health officers could obtain such instruction, would fill a long-felt need, and greatly benefit the country.

One of the most promising fields for public health work is to be found in the co-operation of great commercial organizations with health authorities for improvement in sanitary conditions. It is being recognized by these corporations that the financial losses from sickness and ill health are enormous, and that much

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of it is due to conditions that are preventable. The conservation of the health of employees therefore becomes a question of financial and economic importance.

This offers a fertile field for study, and will lead to scientific investigation of all the conditions that affect the efficiency of workers.

Several of the great insurance companies, realizing that it is more economical to prevent sickness than to pay sick benefits and death losses, are interesting themselves in the health conditions of their policy holders.

In time this work will doubtless extend to an organized effort, undertaken in connection with the health authorities, to improve the health conditions of the entire community as the best method for health protection.

The question of the care, preparation and service of food in public eating places are beginning to receive attention, and in some states such places are being regularly inspected.

There is considerable danger of the spread of typhoid fever, tuberculosis, and other diseases through cooks, waiters and others handling food who are infected with these diseases. A systematic inspection of these persons to eliminate carriers of disease is most desirable, and will be established when there is a strong public demand for it.

I believe that the time will come when the public generally will refuse to patronize any public eating place that does not display a certificate from the health department showing that the place has recently been inspected and found in good sanitary condition, the food wholesome, and prepared and served in a proper manner.

There are many other phases of this interesting question that I would like to discuss, but the subject is so vast, and my time so limited, that I can only mention these salient points. If what I have said has been sufficient to attract your attention to these matters; I may hope that you will be stimulated to interest yourself in the health conditions of your community, and will lend your aid to local, state and national health authorities in safeguarding the health of the country.

It needs no prophetic eye to discern in this movement the dawning of a new day. It is being realized as never before that many

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diseases are unnecessary and preventable. We no longer regard sickness as a dispensation of a wrathful Providence sent as a punishment for sins. We know the cause, and methods of spread of most of the infectious diseases, and it remains for us to apply the remedy.

Looking toward the future, the skies are bright. We have reason to hope that the time is coming when the broad principles of hygiene, and the measures necessary for the conservation of health, will form a part of the education of every man, woman, and child in this country; that this knowledge will lead to the adoption of such measures for the protection of the health of the public that many of the most common preventable diseases of today will be known by name only,—a memory of the pioneer days of sanitary progress.

With the elimination of these diseases, and the application of the principles of sanitation and right living, it is not too much to hope that the race will grow into a stronger, better and happier people, whose lives, freed from many of the ills to which the flesh now is heir, will reach that state of physical, mental and moral development that should be the natural heritage of mankind.

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THE PRESIDENT'S SPEECH OF ACCEPTANCE.*

By Surgeon W. C. BRAISTED, U. S. Navy.

Mr. Chairman, and Members of the Association:

I DESIRE to express my appreciation of the honor conferred on the Navy, and incidentally on myself as representing the Navy, in your selection of President of *our* Association for the coming year.

Your new President enters on the duties of his position with considerable hesitancy due to a realization of the responsibility resting largely on him for the year's successful progress and welfare of this Association, and due to the hope that our next meeting shall measure up to the high standard of past years.

Equipped by an intimate knowledge of the routine of association work following many years of activity in almost every position from membership on the Literary Committee to Vice President of the Association, your new President should have a reasonable grasp of the nature and method of pursuing the yearly routine of his new office. Due to this training he has a lively appreciation from many former campaigns of the difficulties and perplexing problems to be encountered and overcome in bringing each year's work to a successful and satisfactory conclusion.

The sympathetic and earnest co-operation of every member of the Association is therefore invited and will be welcomed, for it is fully realized that success is never due to one man's effort, but to the hearty and interested co-operation of every member of the organization.

In selecting our President this year, we have departed from the usual routine and presented the Fleet Surgeon of the Atlantic Fleet. Hitherto the selection, in the Navy, has fallen on a Chief of Bureau or other high ranking officer on shore duty.

Whether this selection of an officer from the midst of the great medical activities of our largest and most important fleet will be

*Delivered at Baltimore, Md., October 4, 1912.

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for the best interest of the Association or not remains to be seen. Personally, I should have preferred that the present Surgeon-General of the Navy had been selected, as has been customary, representing as he does, to an unusual degree, our most able and distinguished type of Naval Medical Officer. As this seems to be impossible this year, we shall be fortunate in having his deep interest and powerful and kindly co-operation in our work.

The Naval Medical Officer, at sea, feels keenly his isolation from his fellow officers ashore, and the selection of one of their number as their representative in the Association it is hoped may bring them into closer and more intimate relation with the work of this society.

Should it prove that these men who are in the fullest sense most closely in touch with the practical naval medical problems of the force afloat are stimulated to renewed interest in the welfare of this body we should hope to find the presentation at our next meeting of those actual living problems that are confronting us today and that should be of the deepest interest to us all.

During the past year the growth of this association has been in the main satisfactory and progressive. It was the idea of the pioneers in this organization that the opportunity for an Association of Military Surgeons was not only possible but demanded for the best interests of our great and rapidly growing nation with its developing Army and Navy, and especially for the encouragement, mutual acquaintance and professional progress of those great and most important organizations of state and nation outside the regular Military Services. These organizations are of the utmost importance to the national welfare, and we all look with pride and expectant hope to the National Guard, our reserves, our many state Military organizations, our Naval Militia, and last but not least to our brothers in the Public Health Service, the finest and most progressive in the world and whose co-operation in peace and war has always been so kindly given and highly appreciated.

Never has the splendid opportunity for medical military work been so great as at the present moment. Fresh from the experience of the Boer, our own Spanish-American, and the late Russo-Japanese wars, not only the medico-military minds but the

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laity, both of the services and the country at large, are fully awake, at last, to the importance of medico-military problems and offer not only their eager and enthusiastic aid and influence, but are even urging and pushing us forward to better and more perfect conditions that pertain to the health and welfare of our National defenders, and thus stimulated by the splendid work of accomplishment which has crowned the efforts of so many brilliant and self-sacrificing medical officers, the whole nation is being permeated by the determination to overcome, so far as human efforts can, the ravages of disease and disaster both of war and peace.

As the only representative body of organized Military Surgeons in this country, how broad is our opportunity and how great is our responsibility to attempt to live up to these high conditions imposed on us by the present sentiment and expectations. Let us be awake then to our work, realizing that every day is valuable to us for the preparation for the test that may be on us at any time, and the successful results that will be expected and demanded.

Much has been accomplished, the Army is exultant with its advance in organization, equipment, and its discoveries in preventive medicine, and the origin and control of diseases that have baffled the efforts of the world for years.

Our Navy, medically, never was on a better footing than it is today, we think it the finest in the world; this has followed twenty years of the most earnest, constant effort, marked by several brilliant administrations, which will probably rank as the greatest and most progressive period that the Naval Medical service will ever know, and has been followed by the appointment as Chief of Bureau one of the most capable, active and brilliant administrators either in civil or military life that the country has produced—Surgeon General Stokes.

More far-reaching and important, in view of the fact that its scope extends to the Nation as a whole and to many foreign countries, is the unparalleled work of our splendid pioneers in the Public Health Service.

I love to dwell on their work and achievements and to look forward to the time when the full fruition of their efforts will be seen and known in the perfect sanitation of every community in our wide country.

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We are all in the midst of the most active, progressive reorganization, and it is to be hoped that the spirit of the times may not flag until the work of each organization is safely completed and made permanent.

This Association, then, being primarily for the dissemination of the active work of the regular services to our representatives in the various state organizations should be recognized as the principal exponent and source of help to these growing factors that will make up so large a body of our active forces in time of need.

As any organization to be successful must command the active interest of its individual members, so this association should devote its energies to the development of our allied brothers in the National Guard and other similar organizations, and to this end every possible opportunity should be given these members to take active part in the society's proceedings. It is my opinion that more of these officers should be represented among the active officials of the society, and that they should have as far as possible the direction and active participation in the Association's work and meetings—and that the routine of the higher offices should be more frequently in their hands. We of the regular service are looked on as the elder brother to encourage, advise and instruct as our experience may enable us to be of help.

The three main vital factors of the Association are:

1. Its Journal as the outward expression of its work, conveying to the world and to our members the work being undertaken, and being the permanent record for each member of the consideration and solution of the problems before us. The material for the Journal consists largely of the papers and discussions presented at the meetings. What the Journal will be for the coming year is largely the matter presented at this meeting. In order that this Voice of the Association may speak to its members next year with force and interest, each military organization of the Association, through its Literary Committee, should begin at once the consideration of papers for the next meeting. Let me urge you not to delay earnest personal solicitation of your individual members from now until next August, for the best in the way of literary effort that can be produced for our coming meeting. In this way, above all others, will the welfare and success of the organization be perpetuated.

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2. Our Finances, to enable us to carry on the work of the Association. The source of these funds comes almost entirely from our membership and the Journal. Hence the importance of increasing our members and of making our Journal of such value and interest that its circulation may be as great as posible, both to the members of this organization and to those outside who may be interested.

3. Our Membership. At the present time a new and very important source of membership is opened to us by the establishment by Congress of the Medical Reserve Corps of the Army and Navy. The number in these corps is unlimited, comprises the best medical talent in the country, and if brought into the society its members could easily be made one of our most important and strongest elements, giving professional value and prestige to the Association second to none in this country.

Each Reserve officer should be informed on his entrance to the regular service of the aims and objects of the Association and of the desirability of his contemplating membership. The consideration of this source of increased membership will be given special attention this year.

The interest of the line officer of the services in medico-military matters is so great and their advice and co-operation so valuable that it would seem wise and advisable to open the Association to such as desire associate membership. Many valuable papers, and much useful information could be gained by the co-operation in the Association of this type of member. The membership of leading officers of the regular services would give added interest and increase the influence of the Association for good. I would suggest that this proposition be given consideration during the coming year, looking to an amendment to our constitution favoring this type of membership.

I have already taken too much of your time in what is intended as simply a word of acceptance from the incoming President, but my heart is full of the subject and I cannot help giving expression to a few of the many thoughts that have come to me in the years gone by.

In the light of what has been said, how bright may be the future of this Association. With a following embracing so many splendid organizations, with a common purpose for the good of the country, actuated only by feelings of loyalty and patriotism, freed from the taint of commercialism, selfishness and self-

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seeking, we meet and work under the most ideal conditions. In the years to come I predict that membership in this Association will be to us one of our most cherished attachments, and I trust the time will come when every military surgeon will feel that his highest professional honor will be found in his connection with this organization.

Many of us who meet from year to year the representatives from foreign countries, who express their interest in our work, have even ventured to think of one great international Association of Military Surgeons, bringing together the information of the world year by year and unifying and perfecting our profession by the best that every nation can produce.

I trust that during the coming year each member of the Association will give some time frequently to careful and deep thought for the welfare and interest of the Association, and that the result will be such a meeting next year as may show the spirit of rapid progress.

As I leave this meeting, I shall hope that each one here will carry with him the determination to seek out from the coming year's work something that may be of interest for the next meeting. In the paper which I shall hope to present to you on this date I shall endeavor to give you an insight into the practical medico-military problems of the year's work under actual conditions with the fleet.

There is so much today that is tentative and formative that it has seemed to me that each year we should have from a representative of each service and organization a succinct and careful résumé of the year's progress, which, published in the Journal, would be of great value in years to come for reference.

Thanking you for your attention and hoping for your active interest and co-operation, I bid you farewell till we meet again.

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EXPANSIVE BULLETS.*

Their Use in Modern Warfare Should be Condemned.

By Colonel E. R. GARCIA, Physician-Surgeon of Mexican Army, the Delegate of the Government of the United States of Mexico.

THE continuous endeavor of the armies of the world, and noble and worthy of praise it is, has for the past several years been directed to producing armament not only simple in construction, sure in action and light in weight, etc., but also, and very especially perhaps, that which would be less destructive in effect, or, we may say, more humane. In short, an effort has been made to produce weapons which, while effective in putting adversaries out of combat, would be less destructive and fatal, or, in other words, would reduce the number of combatants without depriving them of life. With this object in view the caliber of weapons has been reduced to from 6 to 9 millimeters.

An endeavor has likewise been made to so modify the several components of powder as to increase the velocity of the projectile and thus to enable the carrying on of warfare under the conditions demanded by our epoch.

The manufacturers also, keenly appreciating the objects sought by scientific military officials, have interpreted their ideas so faithfully, exactly and advantageously that it may be said they have attained a truly admirable perfection. Indeed, if we look at the weapons themselves we find them a real work of art, and if we observe the projectiles used we likewise find them a complement of the weapons. The invention of smokeless powder was a great step toward true progress, and its general use, both for artillery and portable arms, is worthy of applause and represents a real conquest.

Unfortunately, the noble and elevating endeavors of some have been sterile as against the efforts of many, who attracted by speculation or, what is worse, inhumanity, have evilly seized upon these valuable conquests of science. Indeed, with absolute lack of

*Read at the 21st Annual Meeting.

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altruism and feeling, with little or no love for their fellow-beings, they have conceived the idea of manufacturing expansive projectiles which cause so much destruction and suffering, counteracting thereby the established laws and rules agreed upon by the principal Governments of Europe, the laws of warfare and humanity, and the international and public laws, opposing in this way the most generous wishes of scientific military officials in the modification and reformation of arms in order that these might justly deserve the name of "humane weapons" with which some have been baptized.

It is hard to realize that in the epoch in which we live, proud as we are of the culture and civilization we have attained in all branches of human knowledge, there should be one thing to mar that civilization and cause us to retrograde and to place ourselves as regards feeling and humanitarianism, on a level with races which, to the honor of humanity itself, have disappeared; this one thing is the manufacture of expansive bullets. True it is that such were their effects, such their destruction, and such the indignation caused throughout the whole world upon learning of the manufacture of such projectiles, that almost all civilized nations, enraged at the thought of such an evil, protested as one and proposed that their manufacture be prohibited and made an offense punishable by law.

The declarations made at St. Petersburg on the 11th of December, 1868, and later adopted by all the Governments of Europe, set forth that:

"The progress of civilization should have as an effect the lessening as far as possible of the calamities of war; that the only real object of governments in time of war should be the weakening forces of the enemy; that it would be exceeding this object to employ weapons which would uselessly aggravate the sufferings of wounded men or make their death inevitable; therefore, the use of such weapons should be contrary to the laws of humanity."

Representatives of the European governments met in Brussels in July and August, 1874, and agreed upon Article 12 of their project, which reads as follows:

"The laws of warfare do not grant unlimited rights to the belligerents as regards the choice of means to be employed in dis-

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abling the enemy," and in Article 13 they further agreed upon prohibiting certain of these means.

In the conferences at The Hague in 1899 and 1907, the representatives of the governments established the same rules in Article 22 of the rules relative to the laws and practices of warfare on land, signing them on the 29th of July, 1899, and 18th of October, 1907. Article 22 of these rules reads: "The belligerents have no unlimited right as regards the choice of means for disabling the enemy."

Article 16 of the Instructions of 1863, for the United States, declares that: "Military requirements do not authorize committing acts of cruelty," and in generalizing this principle, adds "War does not imply any hostile act which might unnecessarily make the conquest of peace more difficult."

As may be seen, the agreement on this point is complete. The European representatives, the President of the United States and the most authoritative authors, are unanimous in proclaiming the principle that the laws of war do not concede unlimited rights to the belligerents respecting the choice of means destined to disable the adversary; that it is necessary to prohibit all acts which may be contrary to the laws of humanity, without being useful or necessary for the legitimate object of the war.

The means of attack and defense have been divided into two classes, illegitimate and prohibited means, and legitimate and permissible means.

Illegitimate and Prohibited means: Are those which are prohibited, some as barbarous, others as perfidious. Barbarous means are those such as the wounding or maltreating of an enemy who surrenders. From the moment no resistance is offered an enemy is to be treated as a prisoner of war. Other barbarous means are the killing of the wounded; and declaring on account of anger, vengeance or for intimidation, that no quarter will be given the enemy. No body of troops has a right to declare that they will not grant quarter and, accordingly, not accept quarter. (American Instructions, Arts. 60, 61, 62, 68 and 71.) "Military requirements do not authorize committing acts of cruelty, that is to say, to provoke suffering merely for the pleasure of causing suffering, or to take vengeance, or maltreat or wound an enemy

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not in combat, or cause such enemy to undergo torture to compel him to make revelations." Such are the precepts of The Hague rules of 1899 and 1907, Art. 23.

Infernal machines and arms causing unnecessary sufferings or aggravating already cruel suffering, are likewise prohibited. As an example, poisoned arrows are mentioned and arrow points having saw-like edges; the slung-shot, ground glass, and bullets altered in any way; and in naval warfare, heated projectiles, chained projectiles and percussion caps. Fortunately, and to the honor of humanity, all these barbarous objects are today relegated to oblivion and have long ere this passed to the store of discarded weapons at the arsenals.

An effort has also been made recently to prohibit all projectiles which cause unnecessary harm and atrociously cruel or incurable wounds, and with good reason, since is it not sufficient to put an adversary out of combat?

The British in their war against the revolutionists of India employed the dum-dum bullets, which were constructed, as is known, with a sheet or jacket of nickel covering a core of lead, the lead extending slightly beyond the nickel jacket. The lead spread out over the end of the jacket upon coming in contact with an object. This bullet produces terrible explosive effects in the human body. The use of dum-dum bullets was discussed at The Hague conference in 1899, and at a final vote their use was rejected unanimously with the exception of two votes. Finally, the following resolution was adopted: "The contracting powers deny themselves the use of expansive bullets or others easily deformable in the human body, such as projectiles with hard jackets and having a lead point and core and those having cutting edges."

After the conference at The Hague, the English again used dum-dum bullets in their war against the South African Republics in 1899-1900. They were exercising their rights, however, since they had not accepted the resolution adopted at The Hague in 1899. The South African Republics had likewise not adhered to the resolution reached at St. Petersburg. England declared her adherence to the resolution adopted in 1899 on the 30th of August, 1907, and Portugal followed with a like declaration in the same month.

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I am not informed as to the date of the first manufacture of expansive bullets, but it is quite likely that their manufacture in the beginning, like all evil projects, was surrounded with the greatest secrecy and precaution to avoid discovery or surprise. Unfortunately, the hundred eyes of the Argus of justice were not sufficient to discover and kill this reprehensible business in its origin, and, sad to say, trade in the expansive bullet has had a remarkable extension throughout the world. These projectiles, placed in the hands of those animated by passion, vengeance, reprisal or ambition, and those engaged in fratricidal wars, have been used ignobly and pitilessly. This, specially, has been the case in internal wars which exceed in horrors wars we might call noble when defending our country, or just when sustaining principles, since with such motives war never becomes infamous or inhuman; there is killing, wounding, forgiveness, and then all is forgotten.

Consider the case in my country at the present moment. The internal war in Mexico has been thrust upon the country in the midst of progress and advancement. It will soon be two years since the revolution began in Mexico, and the hosts which today make up the revolutionaries are now only hordes of bandits, with no high or elevating ideal. They are bands whose only flag is plunder, extermination and destruction. All their acts bear the stamp of cruelty, and of passion if not of vengeance. No means is left untouched to carry out their sinister object. Fire, dynamite and savage arms (and if it were within their reach the "curare" of the Peruvian aborigines) are used in realizing their depraved intentions. In the absence of the "curare," however, they have secured from unconscientious merchants of dubious character the expansive bullet. During the period to which I have referred there have been many military encounters between groups of armed men springing up here and there like buzzards upon scenting their prey, and the loyal and self-denying Federal Army, divided into small bodies of troops and scattered throughout the greater part of the country.

A great proportion of the wounds sustained in such encounters have been caused by expansive bullets, and from data which I have been able to collect, all these wounds present similar char-

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acteristics, which may be briefly stated as follows: Soft tissues torn and destroyed (eclaté); blood vessels and nerves likewise torn and pulled out; much comminution of bones. Such are the general aspects of these wounds.

They are exposed more than others to infection; if and by good fortune this is escaped, there are no lack of other conditions which may complicate and retard their natural course. This is easily understood from the characteristics already described. The work of reparation is very painful. Nature with its good and inimitable elements fights and fights, but its triumph is at the cost of extraordinary efforts. What must be the consequences and final results of such wounds? This is easily answered. The bony reparations are with difficulty effected. Any surgical assistance to help nature attain such reparations is not only very laborious but extensive and difficult, and is furthermore incomplete through lack of the proper elements from which to build up. The reparation of the soft tissues, due to the loss of tissue, is slow, difficult and irregular, and at best defective.

The consequences of the foregoing are: bones poorly consolidated, weak, incapable of serving their function, lameness and shortening, this, without taking into consideration the remote consequences of diseases of the bones. Soft tissues are badly healed, leaving irregular scars which are keloidal, painful, weak and exposed to uncomfortable and troublesome dangers. These are the facts shown by experience.

The gravity of these lesions has naturally been in intimate relation to the parts injured. For example, the wounds in the skull and face have all been mortal; and those of the trunk when only the soft parts and skeleton have been injured without penetrating the cavities, the progress of recovery though characterized with complications and dangers have been favorable in the proportion of about 72%; in those of the extremities, without bony lesions or complications, about 96% have recovered; when the soft parts and bony structure have been affected, mortality has been caused principally by osteomyelitis and septicemia in the proportion of 22%. Articular wounds are all serious, and in almost every case disarticulation has been necessary, attended with all its dangers.

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CONCLUSIONS.

In view, therefore, of the presentation I have made regarding expansive bullets and the lesions produced by them, I suppose that all who hear me will be possessed with the same horror and condemnation of the projectiles in question, and I beg to formulate the following propositions:

I. The Governments of all nations, not only those here represented, but of the whole world, are respectfully requested to prohibit the manufacture of expansive bullets.

II. Let us use every means within our reach, whether it be the scientific press, through political and literary channels, or in the schools, academies, and scientific bodies, until a knowledge of all the facts we lament is general and a propaganda is instituted to attain this object, employing therefor every means known to social order.

III. The scientific military officials of the different armies to which we belong are likewise requested to do everything in their power to secure modifications and reforms in armament and projectiles and to make it a principal objective to condemn the use of expansive bullets.

IV. Any active opposition to abolishing the use of expansive bullets must be declared inhuman and cruel.

These are the propositions which I submit with the greatest respect to the illustrious and judicious deliberation of the military physicians assembled in this meeting.

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HINTS ON HEALTH AND INDIVIDUAL SANITATION ON ACTIVE SERVICE.*

By Surgeon Major S. H. CHANG, First Grade Medical Secretary to the War Office, Peking, China.

IN recent years it has been found in our campaigns that the proportion of deaths from disease has been far greater than that of the killed and died of wounds.

This fact is very well known to every one in the medical profession. The reports received from different sources during the course of our recent revolution showed that the deaths from disease were twice to three times as numerous as the killed and died of wounds.

This is, however, to a certain extent preventable. But, all the efforts made by the medical department in order to combat the ravages of disease may count for nothing if the individual soldier is careless, or ignorant of how to keep himself in health and of how to minimize the dangers of contracting disease day by day.

The diseases that play the greatest role are undoubtedly enteric and other similar affections. Impure water is generally recognized as being the chief cause of these diseases. The only effective measure to destroy the germs of these diseases is to boil the water. A filter can only clarify the water but does not act on the germs. A few appliances can be easily provided for boiling water in camps, maneuvers or even on active service.

The water cart should be thoroughly cleaned and disinfected before fresh water is taken into it, especially when water is taken on the march. As with the water cart so is it with the soldier's water bottle. The latter comes easily first as a source of infection. In order to keep a bottle pure it must be rinsed out occasionally with warm water and soda. A weak solution of permanganate of potassium or carbolic acid will free it from the impurities. This disinfection must also be applied to the cork. One should try to drink water only when absolutely necessary, as when on the march. It has been found that lazy soldiers keep

*Read by title at the 21st Annual Meeting.

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their water bottles filled for use in their tents or even in standing camps. This is a very bad habit and is very dangerous to the health. Again men are always ignorant of what pure water is. They think that when water is clear and sparkling it may be looked upon as being safe and pure and that boiling is not necessary. The purity, of course, depends on the source. For instance, the water drawn from the wells in the center of a town such as Peking is more likely to be contaminated with typhoid germs, though it is always clear and crystal-like, than water from the muddy rivers away from the vicinity of the villages. During rainy weather the rain washes with it microbes of all sorts into the wells. Water, therefore, drawn from the wells or streams in the vicinity of a town or village should never be drank without first boiling it, although it may look clear as crystal. Rain water caught in a clean reservoir should be regarded as being safe and good to drink.

Cooking utensils should be perfectly cleaned before use with pure water. Water collected near the refuse pit or latrines endangers health as it is liable to carry with it enteric germs. Camp kettles should not be cleaned with the water collected near to a latrine. The mess kit is another source of conveying disease germs if kept in unsanitary condition. It should be given a good scouring out with soap and hot water or with soda. Dirty mess kits lying about the tents may attract flies. There are no greater conveyers of disease germs than flies. Before alighting in the tents they may have previously rested on putrid matters, sewage, or in the latrines and thus microbes may be transferred to the food of the men.

For hygienic reasons dining rooms should be erected away from the sleeping tents. It is hard to impress upon the men's minds that it is of great importance to keep away food and decaying matters from the vicinity of the tents. These always attract flies.

There is another common cause of danger to the health. That is the habit of spitting; for sputum is, as is well known, the conveyer of tuberculosis germs. The sputum dries and microbes are spread about by the wind. I have found that with ten to fifteen men sleeping together in a room the risk of infection

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is great, for many other diseases may be conveyed by the same agent—the sputum.

The normal temperature of the abdomen should be maintained by artificial means by wearing the "cholera belt" to prevent the risk of chilling which may cause dysentery or diarrhoea. The abdomen with its internal organs is very susceptible to changes of temperature. In North China where intestinal troubles are prevalent it is most important to maintain the normal temperature of the abdomen. The chief objection to this belt is that it encourages vermin, and I have found that in campaign it is sometimes hard to prevent vermin. Sunlight, water and soap are its three chief enemies. The underclothing should then be washed as often as possible with hot water, if procurable. If water is limited it should be brushed thoroughly with a stiff clothes brush under the seams and then put in the sunlight for as long as possible. Blankets should be spread out some distance from the tents in order to air and sun them. The sun will then destroy the vermin. They should be washed when camping near a river or stream and then exposed to the sun for a few hours to dry.

Baths are important for the men, but our soldiers do not require much pressure to make them take baths. When water is limited or scarce and only a canteen full for each soldier can be obtained it is well to pour it gradually on a towel and then to rub it over the body. Exercise is another important factor. In standing camps or in the conclusion of a continuous and long march, men are always inclined to rest. This lowers their vitality and they become much more prone to attacks of disease. It is then better to let them spend a few hours daily in kicking footballs or in other sports or games than to let them employ the time in sleeping or lying down in the tents.

The diet must be carefully considered. A plentiful diet without fresh vegetables is highly dangerous, especially when fresh pork is eaten in hot countries. When taking a long march it is well to have something to eat before sleeping at night, if the chief meal has been eaten during the midday halt. The risk of chilling the stomach is far greater when it is empty. This is more apparent when sleeping out of the tents or in the open air in damp weather. Opportunities may often occur during a march of pro-

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curing fruits from orchards, but care must be taken to eat fruit wisely. Fresh, ripe fruits may not cause mischief if the quantity taken is moderate; fruits overripe or not ripe enough may cause cramps in the stomach or diarrhoea. Apricots, peaches, plums and grapes, which are plentiful in our country, should not be taken without first removing the skin which is quite indigestible. Opinions as to whether alcohol is beneficial or necessary to the health differ widely at the present time. At the rate of half a pint daily "Hsiao-Hsing" ("old wine") seems to increase the vitality of men. In satisfying thirst it is evident that no matter what other faults it may have as compared with water it is free from microbes. Scopious red tea is quite beneficial, but it is sometimes hard to obtain boiling water on service.

Pulmonary diseases, which occur on active service, are often due to undue exposure to all sorts of weather. This is partially due to the carelessness of individuals, but I always find that men are always more afraid of catching cold than of contracting fevers. This is especially true in strange places.

Wet blankets should be dried, if possible, though they are not likely to prove dangerous to the health of men. The great necessity is to keep oneself warm during the night even when the blankets are wet. I have found that it is much better to use a wet blanket as a cover, such blankets are even warmer than dry ones, than to sit up half awake shivering with cold.

Fear or nervousness as to the risks of catching particular diseases may become a danger by depressing the spirits of the men.

The above is a short résumé of the information which it is necessary to impart to the individual soldier on the laws of health and sanitation.

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THE INFLUENCE OF CERTAIN CAMP EPIDEMICS UPON THE GEOGRAPHICAL EXPANSION, POLITICAL HISTORY AND MILITARY POLICY OF THE UNITED STATES.

By Major EDWARD L. MUNSON, A. M., M. D., Medical Corps, U. S. Army.

THE influence of camp disease upon military operations, as demonstrated in practically every conspicuous and momentous period in the world's history, has unquestionably never been clearly nor fully understood, and has received little, if any, serious consideration from the standpoint of its military, political and national significance.

While the tactics and strategy of past campaigns have received much merited attention from the students of military history, there seems to have been little inclination to look behind the scenes of the spectacular military drama and inquire whether the silent and invisible causes of disease, either through an insidious sapping of military strength over considerable periods, or by a sudden calamitous disorganization or practical annihilation of whole military units or commands, were not after all the real factors which, in many cases, perforce determined the action of military commanders.

Nevertheless, it is a fact that by such diseases the ultimate outcome of a resort to arms has frequently been influenced or determined, and that the fate of kings and the destinies of nations hinged upon the military success or failure dependent thereon.

Such failure to seek a possible antecedent and underlying sanitary cause for ultimate military and political results has undoubtedly depended not so much upon disinclination or neglect, as upon general inability to appreciate that such inconspicuous causes have frequently assumed—or could assume—a controlling relation to military operations. Moreover, the subject is one peculiarly difficult to study, since this general non-recognition of its actual importance even at the present time has its prototype in the relatively meager historical records relating theeto; and

*Read at the 21st Annual Meeting.

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nowhere in history does there seem to be any attempt to trace out the relationship of cause and effect as applied to the influence of preventable diseases upon the art of war. Historians are largely silent in respect to such matters; or perhaps pass over in a few words epidemic outbreaks of disease which were the unmistakable and fundamental causes of great military failures on the one hand—and success on the other—directly influencing the hopes and policies of governments and the geography of nations. As laymen, also, historians have not been fully competent to trace out, interpret, and properly understand the profound military and political importance of the "pestilence which walketh in darkness and wasteth at noonday." Hence, even in instances when the direct effect of disease upon the management of campaigns should have been quite clearly manifest, the antecedent sanitary causes are practically never set forth in their proper importance and due relation in history. It is perhaps true, also, that the great majority of historians are not entirely unbiased—even if unconsciously so—and such are not prone fully to record the shameful epidemics which may have humiliated their country, nor, on the other hand, to detract from the glory of its military successes by showing that they were gained against a sickened and consequently a weak, immobile, disorganized and dispirited opponent. Disaster is usually ascribed in history to some military condition such as inferiority of force; yet in such case the patient investigator will not infrequently find that such preponderance of power by the victor depended upon corresponding military weakness and numerical loss by the defeated, resulting from the ravages of preventable disease due to the latter's own neglect. In times more remote, also, epidemics in armies were regarded as almost inevitable and as usually to be accepted as evidence of divine displeasure rather than human dereliction; and not being considered as having any relation to military matters they went almost unchronicled by military historians. All these factors combine to render difficult the study of military epidemiology in its relation to military campaigns. Nevertheless, a close study of the history of wars reveals many instances in which camp diseases appear clearly as the cause of defeat on the one hand and victory on the other.

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To fully understand the operations of a campaign and the results depending thereon, it is therefore always necessary to inquire into the contemporaneous occurrence and ultimate results of camp epidemics, and in the light of this broader knowledge to seek the full explanation for the recorded facts of history. It is true that the strategic conduct of a single battle, upon which the fate of an empire has perhaps hung, may be studied from the map; but it must be remembered that such conflict might not have occurred at all in the place that it did, nor might the military tactics and results have been the same, had not one or the other force been previously weakened and more or less immobilized by disease. Nor can prolonged campaigns ever be properly studied from the strategic side alone, without constant reference to the size and character of the sick report and its probably modifying effect upon military operations; for it is quite evident in the case of collision between two equally armed forces of an originally equal numerical strength, the one with the largest sick report suffers from what may ultimately readily prove to be a decisive military inferiority, dependent not only upon inferior fire effect but upon lowered esprit and decreased mobility. The officially announced intention of the Japanese to avoid this cause of military weakness in their recent war with Russia undoubtedly contributed very materially to their ultimate success.

As a result of the vital influence of the sanitary factor upon the operations and purposes of war, it follows that sanitary measures for the health and welfare of troops must be regarded primarily as of economic importance in the prevention of waste of the most essential military asset—the soldier—rather than in their usual accepted aspect as matters of humanitarian desirability. So, too, in planning a campaign, the probable number of rifles which will be unavoidably lost through disease, and the resulting amount of transportation and impedimenta required, should be discounted in advance and a proper estimate made for a remaining quota sufficient to overcome the anticipated military resistance. Failure to appreciate these basic facts, and to take suitable precautionary measures based thereon, has turned many a possible victory into actual disaster and revolutionized the political geography of the world.

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On the above subject, volumes could be written beginning with the great military epidemics of antiquity, such as the destruction of the Assyrian hosts under Sennacherib in the preservation of the Israelites; the dysentery which frightfully ravaged the army of Xerxes and largely aided in the preservation of Greek civilization; the absolutely annihilating marsh fevers which, on the one hand, drove the Roman forces of Severus out of Caledonia, and on the other hand saved Rome itself from capture by the Gauls under Brennus; passing to the pestilence which destroyed the first crusade under the walls of Antioch; the typhus fever which forced the retreat from before Metz in the 16th Century of the otherwise invincible Spanish besiegers; the dysentery which so weakened the larger, better armed and better disciplined Prussian army at Valmy as to give the victory to the raw French levies, thereby preserving to the infant French Republic the fulfillment of its destiny; the cold and pestilence which destroyed Napoleon's "Grand Army" in Russia, thereby enabling the Allies to encompass his downfall—these and a thousand other instances could be quoted to illustrate the far-reaching effects of military disaster depending upon the lack of due sanitary precaution.

As Americans, however, we do not need to go outside our own relatively brief existence as a nation to find the most illuminating —and to us profoundly interesting—examples of the tremendous influence of camp disease on military and political history. These have to do with our failure to seize Quebec in the Revolutionary War and the destruction some three decades later of Napoleon's veterans in the island of San Domingo. In the consideration of these instances here, it has seemed better and more conclusive that the language of authoritative historians should be quoted verbatim, and only when the historian fails fully to recognize the relation of cause and effect, and to deduce the political results from the unsanitary conditions and military events described, will this plan be departed from.

Taking up the Quebec expedition:

"The invasion of Canada was one of the very earliest strategic moves in the war of the Revolution. From the inception of the struggle with the mother country, the colonists appreciated to the full the military and political advantages to be gained by enlisting

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the Canadians in its support. These advantages, indeed, were so numerous and so obvious that it required neither breadth of statesmanship nor experience in military affairs to recognize them at once. The acquisition of Canada would unite the whole of British America in opposition to the Crown, and strengthen the United Colonies by the possession of a wide stretch of territory, in which were situated two of the principal cities of the continent, one of them a natural fortress of great strategic importance, supplied with all those munitions of war of which the rebels stood in the sorest need. An unbroken front would thus be presented to invasion from England, and New England and New York would not be exposed to the menace of an army allied with the savage Indian tribes, operating in their rear with Canada as a base, and outflanking them on Lake Champlain, Lake George, and the Hudson River." (Page 6, Arnold's Expedition to Quebec, by John Codman, 2d.)

"At this time Arnold, and, indeed, many other men as well, were very strongly in favor of invading Canada. He had already written Congress suggesting a plan by which he confidently believed that 2,000 men might easily win all of that country. He declared that Carleton, the governor of Canada, had only 550 men under him who were of any account, and that word had already been received that the gates of Montreal would be thrown open to the Americans the moment that a strong force of Continentals appeared before the town. He wanted very much to lead the expedition himself, and declared that he was willing to assume all the responsibility of the proposed movement." (Page 77, A Short History of the Revolution, by Everett Tomlinson.)

"There was, moreover, little political mistrust concerning the situation. Canada had been carefully prepared to throw itself into the arms of Congress. The Montreal English-speaking population was regarded, to a great extent, as sustaining the provincial view, and it was thought that its committee of correspondence at Quebec could be counted upon to extend assistance and countenance to the expedition. The French-Canadians were looked upon, under unfavorable considerations, as being strictly neutral, and if no aid would be rendered by, no opposition was to be expected from them. The influence of the priests was known

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to be on the side of the government; but it was considered that it would prove of little avail before the appearance of a strong, well-organized force, which would be unopposed. The theory of Arnold, and it was one which likewise seems to have guided Washington, was that the troops of Congress had nothing more to do than show themselves and effect a junction with Schuyler, at that period in command, when the gates of Quebec would be opened by the sympathizers, with whom he was in correspondence. Quebec had scarcely a soldier; it was considered that the operations which were being carried on in the east of the province on the Richelieu would make all opposition on the part of the city impossible, and that the place would be forced to surrender before relief could reach it. Everything depended on Arnold's celerity of movement, and the passiveness of the French-Canadians, who were confidently looked upon as certain to take the winning side." (Pp. 477-478, The History of Canada, Vol. V, by William Kingsford.)

From both the military and political sides, nothing appeared to be wanting to insure success to the American arms. Quebec had been shown to be not impregnable by its capture when well garrisoned a few years before, and under the present far more favorable conditions it should the more readily fall again. It is true that at the time of Wolfe's expedition the English were masters of the communications by water, while "in the campaign of Arnold and Montgomery the patriots had no control of the sea. They hoped to make up for this disadvantage by attacking Quebec quickly in the autumn, before the British navy could arrive in force; and they relied on the ice to prevent the arrival of the warships until the following spring. Moreover, instead of the heaviest force being massed on Quebec, the weakest force was massed on it. * * * But it was expected that this defect would be made up by arriving soon and suddenly when the garrison was weak and unprepared." (Page 413, The Struggle for American Independence, Vol. I, by Sydney George Fisher.)

"In organizing the expedition, for its chief officer he (Washington) selected Benedict Arnold, who had taken part in the surprise of Ticonderoga, and who in former days as a trader had visited Quebec, where he still kept up a correspondence. The

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detachment from the army around Boston consisted of ten companies of New England infantry, one of riflemen from Virginia, and two from Pennsylvania: in all, two battalions of about eleven hundred men. Provisions for this force for 45 days were taken." (Page 296, History of the United States, by George Bancroft.)

The expedition reached the present site of Augusta on September 21st, embarked in small boats and proceeded up the river. Within a few days "the physical condition of the men, who were now but on the threshold of the most difficult and perilous stage of their journey, had begun to show serious deterioration. Cases of dysentery and other camp evils were augmented by long exposure in the water during the day and the cold, marrow-eating river-mists of night. Invalids were now frequently sent back along the line to the rear division. On October 12, when Lieutenant-Colonel Enos with the fourth division arrived at the Twelve Mile Carrying place, out of the eleven hundred men who left Cambridge, the detachment could now muster only nine hundred and fifty. The loss had been chiefly occasioned by sickness and desertion." (Page 54, Arnold's Expedition to Quebec, by John Codman, 2nd.)

And Bancroft, in his History of the United States, page 299, says:

"From Dead River, Arnold on the thirteenth wrote to the commander of the northern army, announcing his plan of co-operation. Of his friends in Quebec he inquired what ships were there, what number of troops, and what was the disposition of the Canadians and merchants; and he rashly made an Indian the bearer of his letters."

This Indian was captured by the Canadians and gave them the first intimation that Quebec was threatened.

About this time dysentery and smallpox were added to the other ills that wasted Arnold's command. Hampered by his sick, which humanity would not permit to be left behind in the wintry wilderness, Arnold was forced to halt, in spite of the growing scarcity of provisions, until he could arrange to send home his sick along the trail to the rear. This evacuation was accomplished with great difficulty, and at the fatal expense of detaching a large number of troops whose continued presence was absolutely in-

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dispensable to the success of the expedition. Tomlinson (page 79, A Short History of the Revolution) says: "Before the fearful march of thirty-three days had been completed, two hundred had perished and as many more had turned back toward Cambridge, carrying with them others who were sick or helpless."

After many delays, the undaunted remainder finally reached the St. Lawrence. "They had set out with 1,100 men * * *. Those who stood looking at Quebec, half armed, in rags, were about 510. The expedition had already failed. * * * They were now too late to take Quebec by surprise, as might have been done a few days earlier. By the labor of seven weeks, Cramahè, the lieutenant-governor, had put the walls of Quebec into a good posture for defence. Communications, intrusted by Arnold to friendly Indians, had been, in part at least, intercepted. A vessel from Newfoundland had brought a hundred carpenters. Colonel Allen Maclean arrived on the twelfth with a hundred and seventy men, levied chiefly from disbanded Highlanders who had settled in Canada. The Lizard and the Hunter, ships-of-war, were in the harbor; and the masters of merchant ships with their men were detained for the defence of the town." (Page 301, History of the United States, by George Bancroft.)

Against this greatly strengthened force, Arnold and his 500 men clearly could accomplish nothing. Sickness had not only deprived him of the overwhelming military advantage of surprise, but had destroyed what had been an original and essential preponderance of military force through death, disease, and the detachment of a large part of the able-bodied to look after and return the sick. From the military standpoint, Arnold's expedition, if carried out as conceived, should have been a complete success—but the fatal oversight was made of not solving in advance the problem of sickness as possibly affecting the purely military plans. So potent are the invisible links in the chain, which bind together the great events of history and may unite or divide an empire.

To the occurrence of this unforeseen disease, with its delays and defections, can fairly be traced the failure of the expedition, the repulse before Quebec, the retreat from Canada and the loss of British America to the American Union. Had this disease

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been prevented—or even had it been anticipated and provided for by proper arrangements for caring for and evacuating the sick—the American flag would now, in all human probability, be floating over the entire continent from the Rio Grande to the Arctic Seas, and the colony of Canada would have united with the other English colonies of the continent in the formation of a greater North American Republic.

Opportunity rarely comes twice, but in relation to the possible conquest of Canada it seems to have done so. It is true that Arnold's intended surprise and subsequent attack had both failed, but Montgomery's ever-victorious forces moving up from the capture of Montreal and Three Rivers had yet to be reckoned with; and not for at least seven months could any succor reach the beleaguered garrison of ice-bound Quebec. Carleton had arrived in Quebec after surrendering Montreal, bringing with him 120 British regulars; but his forces were still far inferior to those of the Americans. He never had at any time more than 1,200 men to oppose the nearly 5,000 which the Continental Congress sent against him during the winter. Why, then, did not this superiority of force secure decisive military results? The answer is found in the sick report of the Continental troops, for with the exception of one action in which only a fraction of the American forces were physically capable of participating, there was practically no fighting. Heavy reinforcements sent in from time to time did not even make good the steady loss from disease and death. Smallpox was rife, and Kingsford states that upward of 500 men lost their lives before Quebec during the winter from this and other diseases—a much greater destruction than the arms of the enemy were able to effect. This disease so rapidly depleted the command that the belated assault failed from the physical as well as the numerical weakness of the assailants, Kingsford stating that over 200 of the prisoners had been lately recovered from smallpox. Thereafter only a pretense of siege could be maintained by the Americans.

Bancroft says: "Thomas arrived near Quebec on the first of May, and employed three days in ascertaining the condition of his command. He found 1,600 men, including officers, beside 300 whose enlistments had expired. The sick numbered 900, chiefly

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of the smallpox, which had raged among the Americans with extreme virulence, so that men feared to be near one another, and there were officers who advised to inoculate all of them who were liable to infection. Of efficient men there were but 700; and of these not more than 300 could be rallied at any one place. * * * On the fifth, a council of war agreed unanimously to prepare for a retreat. The decision had been delayed too long. Early on the sixth, three British ships-of-war, which had forced their way up the St. Lawrence when it was almost impracticable from ice, came into the basin and landed their marines and that part of the 29th Regiment which they had on board; and not far from noon, while the Americans were embarking their sick and their artillery, about 1,000 men, in two divisions, sallying out of the gates of St. John and St. Louis, attacked the American sentinels and main guard. Thomas attempted to bring his men under arms; but, unable to collect more than 250 on the plains, he directed a retreat to Deschambault, forty-eight miles above Quebec. The troops fled with precipitation, leaving their provisions, cannon, 500 muskets, and about 200 of their sick. * * * At Isle-aux-Noix the men fit for duty remained for eight days, till the invalids could be taken to Crown Point. A physician who was an eye-witness said: 'At the sight of so much privation and distress, I wept till I had no more power to weep.' Early in July the fragments of the army of Canada reached Crown Point. Everything about them was infected with the pestilence. 'I did not look into a tent or a hut,' says Trumbull, 'in which I did not find either a dead or dying man.' Of about 5,000 men, housed under tents or rudely built sheds or huts of brush, exposed to the damp air of the night, full half were invalids; more than thirty new graves were made every day."

Kingsford, in his History of Canada, Vol. V, page 483, says: "Such had been the position of the province of Canada at the close of November, 1775. The only scrap of territory which remained under British rule was the city of Quebec within the ramparts. The troops of Congress held the forts of Saint John's and Chambly; they were in possession of the city of Montreal, which had submitted to their authority, and Three Rivers had accepted the new rule. The country parishes were not in every respect

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satisfied, but any hostility which existed in those localities in no way gave ground for any serious anxiety.

"The possession of Quebec during the winter of 1775-76 was to determine who was to be the future master of Canada. Held by the Congress troops during the winter, under a soldier so distinguished and experienced as Montgomery, it is hard to tell what would have been the fate of the fortress, if attacked in the ensuing spring, by the reinforcements which arrived from England.

"At this time, and with success attending the arms of the Americans, the allegiance of the French-Canadians hung in the balance. It is simply a duty to record that this feeling passed rapidly away, and never again obtained activity. During the period of the whole struggle the French-Canadians remained attached to the British Government, and no encouragement was given for a second invasion of the province. It is true that the weight of the contest in the colonies called forth all the efforts of the troops of Congress in New York and in the south; but the probability is that had the opportunity again presented itself to have detached Canada from its connection with Great Britain, the attempt would have been made."

Certain it is that since the Revolution no such opportunity for the absorption of Canada into the United States has occurred as existed at that time; and in the light of history and present events it appears unlikely that such opportunity will occur in the future. Twice within a few months the American forces had the prize almost within their grasp, only to lose it through internal and preventable causes, and their own weakness and sanitary defects rather than any actual military resistance which the enemy was capable of making. While there remains no detailed record of the insanitary conditions which brought about this disaster, we may be sure that they were shameful and characteristic of what almost invariably occurred whenever our raw provincial or Continental troops took the field. A good description of such a camp and its results is given of the provincial troops at Fort William Henry on Lake George in 1756, in an official report quoted by Parkman: "There are here about 2,500 men, 500 of them sick, the greatest part of them what they call poorly. They bury from

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5 to 8 daily, and officers in proportion; extremely indolent and dirty to a degree. Their camp is nastier than anything I could conceive, their latrines, kitchens, graves and places for slaughtering cattle all mixed up through their encampment." And of the provincial troops encamped at the same time at Fort Edward, also on Lake George, a Massachusetts surgeon wrote: "A grievous sickness among the troops. We bury 5 or 6 a day. Not more than two-thirds of our army are fit for duty. Long encampments are the bane of New England men."

Like all raw recruits, our provincial soldiers were unwilling to take care of themselves, and apparently Montgomery and Arnold, like many line officers before and since, did not appreciate the vital importance from the standpoint of military economics, aside from any humanitarian considerations, of enforcing such ordinary and well-known rules of health, cleanliness and sanitation as had been prescribed and enforced by Moses when he led the wandering hordes of Israelites out of Egypt forty centuries before. That these causes of disease and disaster were recognized by the army medical men of the time as always threatening a military force, and that they understood more or less effective methods of prevention, are shown by publications of the time. The inference that the counsel of the continental medical officers must have been omitted or disregarded when the plans for the invasion of Canada were conceived and executed by the line officers responsible, whose neglect of the fundamental principles of sanitation, in what was even then common knowledge, brought their military talents to naught, unquestionably greatly prolonged the Revolutionary struggle, and will probably forever debar this country from expansion northward along her legitimate geographical, racial and political lines.

In the light of its result upon the political development and history of this continent, the capture of Quebec from the French by Wolfe is included in the supplementary list of Creasy's "Decisive Battles of the World." It is certainly reasonable to assume that had it been later captured from the English by our Revolutionary forces such further changing of sovereignty would have had an equally profound world-significance and a fundamental effect upon the politics and geography of North America.

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Turning from this inglorious record of human suffering, military disaster and wasted national opportunity due to our own sanitary incompetence, it is of interest to us to consider another military epidemic outside of our own country and with which we had nothing whatever to do, yet the direct results of which have been of incalculable influence and advantage in the expansion, development and policies of our country. It is not too much to say that, after the recognition of our independence, the most important event in our national history was an epidemic of yellow fever, even the occurrence of which is probably known to but few students of military history and the far-reaching results of which appear to have been traced by none.

The country immediately affected by this second sanitary disaster was France, whose foreign policy of the time in respect to the Western Hemisphere must first be briefly considered.

If we review French history for the early part of the last century, we find for the year 1802, on page 214, of Thiers' "The Consulate and the Empire," Vol. III-IV, the following outline of such policy:

"The desire to possess distant possessions was an old deep-seated feeling of ambition, which the reign of Louis XVI, the palmy days of our navy, had aroused, and which subsequent maritime reverses had not yet completely extinguished. The possession of colonies was, at that time, eagerly coveted by all commercial nations. The expedition of Egypt, which had been undertaken with a view of disputing the dominion of the East Indies with the English, was the natural consequence of this universally prevailing inclination, and its unfortunate issue had excited a very earnest desire to compensate for this loss in some other way. The First Consul proposed to indemnify us in two modes, by Louisiana and St. Domingo. He had granted Tuscany, that fertile and valuable portion of Italy, to the court of Spain, in order to obtain Louisiana in exchange; and at this moment he was pressing for the due performance of the engagement entered into by that cabinet. He was determined, at the same time, to repossess himself of the island of St. Domingo."

And again, on page 89 of the same work, it is recorded that:

"The First Consul having the duchy of Parma at his disposal,

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was ready to cede it to Spain, at the price of the Floridas and the cession of a small portion of Tuscany, the Siennese, with which he purposed to indemnify the king of Sardinia. The indiscretion of the Spanish government having allowed the particulars of this negotiation to come to the knowledge of the ambassador of England, British jealousy raised a thousand obstacles to the conclusion of this new bargain."

Henri Martin, in his "History of France," Vol. II, page 182, says:

"Having traced the course of domestic events up to the establishment of the Consulate for life, we must turn back a few months and survey Bonaparte's foreign policy.

"He had conceived the plan for raising the colonial power of France, so great towards the middle of the eighteenth century, so cruelly lessened by the cowardice and incapacity of the government of Louis XV, and almost destroyed by the war and the revolutionary crisis in the Antilles. The restoration of Louisiana by Spain, and her cession of the eastern part of San Domingo, mark Bonaparte's first step towards this new end."

Goldwin Smith, in his "Political History of the United States," states:

"It was a principal aim of Bonaparte's policy to give France a colonial empire; he had wrested from the weakness of Spain the intercession of Louisiana * * *."

These quotations could be indefinitely added to from the works of other historians, but further evidence as to the purpose and magnitude of Napoleon's colonial ambitions on this continent would appear to be unnecessary. That he was strongly supported by French public opinion as well as impelled thereto by motives of domestic political policy in his purposes and endeavors seems well established, for we read again (Thiers' "The Consulate and the Empire," Vols. III-IV, pages 215-217) that:

"A considerable portion of the French nobility, already deprived of their property in France by the Revolution, were also proprietors of estates in St. Domingo, and had been plundered of the rich possessions which they had formerly held in that island. They were refused the restoration of their estates in France, as they had become national domains; but it was in our

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power to restore to them their sugar and coffee plantations in St. Domingo, and this compensation seemed in some measure to satisfy them. These were the various motives which influenced the proceedings of the First Consul. To recover the greater part of our colonies, to hold it, not by the tenure of the doubtful fidelity of a black raised to dictatorial power, but by force of arms; to keep firm possession of it against the blacks and the English; to restore to the old colonists their estates, which were to be cultivated by free labour; finally, to connect this queen of the West Indies with the mouth of the Mississippi by the acquisition of Louisiana—such were the combined objects which the First Consul had in view; a combination of objects certainly much to be regretted, as will soon be seen, but imperatively required, so to speak, by the general opinion prevalent in France at that period.

"It was very important to use the utmost expedition, as, although the definitive peace negotiated at this moment at the Congress of Amiens was almost certain, yet it was necessary, at all events, in case the English should raise new and inadmissible pretentions, to take advantage of the interval during which the seas would be open to despatch the fleet. The First Consul caused an immense armament to be prepared at Flushing, Brest, Nantes, Rochefort, and Cadiz, consisting of twenty-six ships of the line, and twenty frigates, capable of transporting 20,000 men. He appointed Admiral Villaret-Joyeuse to the command of the squadron, and General Leclerc, one of the best officers of the army of the Rhine, to the command of the troops; the latter had recently married his sister Pauline. He insisted upon his sister accompanying her husband to St. Domingo. * * *

"The First Consul applied his accustomed energy to the speedy completion of these preparations, and as much as possible urged the departure of the several naval divisions, distributed in the various ports situated between Holland and the southern extremity of the Peninsula. However, before they set sail, he was under the necessity of coming to an explanation with the English ministry, to whom this vast armament occasioned considerable misgivings. He had some difficulty in satisfying them upon this subject, although, in fact, they were rather desirous

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that the expedition should proceed. They were not, at that time, so eager for the emancipation of the negroes as the English ministers have since that time appeared to be. The freedom of the blacks of St. Domingo inspired them with great alarm for their own colonies, and above all for Jamaica. They were anxious, therefore, for the success of our enterprises; but the extent of the means employed disturbed them, and they would have preferred the troops being sent over in transports. We succeeded, however, in inducing them to listen to reason; and they reluctantly acquiesced in allowing this immense armament to put to sea, at the same time despatching a squadron to watch its movements. * * * The chief naval division, equipped at Brest, set sail on the 14th of December. The others followed shortly afterwards. By the end of December, the whole expedition had put to sea, and would consequently reach St. Domingo, whatever might be the final result of the negotiations of Amiens."

Landings were made in several places in San Domingo in February with forces aggregating more than 20,000 men. Against this overwhelming force of trained soldiery the surprised, disorganized and outnumbered force of blacks could make no stand, and it is recorded that within ninety days the French had completely overcome all armed opposition and were in full military possession of the island. The troops not needed to administer and police the reconquered territory were now free in a military sense to carry out the rest of Napoleon's plan, continue to Louisiana and establish French sovereignty with the waiting fleet and transports, and organize the proposed French colonial empire on the North American continent. But at this point the unforeseen and invisible factor of disease destroyed forever the hopes of Napoleon and the plans of his statesmen and generals.

Again referring to Thiers' "The Consulate and the Empire," Vol. III, pages 185-186, one reads:

"We have seen the captain-general Leclerc, after well-conducted operations and a considerable loss of men, become master of the colony, having reason to flatter himself even that he had restored it to France, and Toussaint, retiring to his habitation at Ennery, waiting there for the month of August as the term of the reign of the Europeans in the island of Haiti. That terrible

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black predicted truly when he foresaw the triumph of the climate of America over European soldiers. * * * Scarcely had the army begun to establish itself, when the noble soldiers of the army of the Rhine and of Egypt, transported to the West Indies, were attacked by a scourge frequent in those parts, but this time more destructive than ever. Whether the climate, from some unknown decree of Providence, was this year more fatal than usual, or whether its action was more powerful upon fatigued soldiers, crowded together in considerable number, forming a stronger focus of infection, death swept them away with awful rapidity and violence. Twenty generals were carried off nearly at once; officers and soldiers perished by thousands. To the 22,000 men brought by several squadrons, 5,000 of whom were hors de combat, and 5,000 ill of various diseases, the First Consul had added about 10,000 more. The newcomers, in particular, were seized at the very moment of their landing. Fifteen thousand men at least perished in two months. The army was reduced to nine or ten thousand soldiers, seasoned, it is true, but mostly convalescents and unfit to resume arms immediately."

Martin says: "Yellow fever, the scourge of the tropics, broke out in the French army at the Antilles and raged with great fury. In vain the First Consul doubled the army. Whole divisions melted before the yellow fever like wax in the sun, and their remnants were forced to shut themselves up in a few strongholds."

Within six months after landing, and despite heavy reinforcements, the quota of troops intended for the garrisoning of Louisiana after the reconquering of San Domingo had been absolutely annihilated, with resulting necessary complete change of political plans by Napoleon, who was forced by the necessities of imminent war with England to make immediately as advantageous disposal as possible of the unoccupied territory on the mainland which he had not now men enough across the seas, soon to be swept by the superior English fleets, to take possession of and hold. And with the loss of Louisiana itself, negotiations with Spain for the further contemplated cession of the continuous territory of the Floridas were necessarily abandoned.

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Martin says: "Thenceforth he thought only of war, sending aides-de-camp to Russia and Prussia to dispose them in his favor, beginning preparations on a vast scale for a descent on England, and giving up his schemes for restoring colonial power, already so compromised at San Domingo, and incompatible with naval war."

And Thiers writes of the month of May, 1803 ("The Consulate and the Empire," Vol. III-IV, pages 165-167): "To all those determinations (of Napoleon), so promptly taken, was to be added one more relative to Louisiana. * * * But what was to be done? What plan was to be adopted in regard to that rich possession? There was no reason to be uneasy respecting our other colonies. St. Domingo was full of troops, and the soldiers who were disposable in the colonial depots were hastily put on board all the merchantmen ready to sail. Guadeloupe, Martinique, the Isle of France, were likewise provided with strong garrisons, and immense expeditions would have been required to dispute them with the French. But Louisiana contained not a single soldier. It was an extensive province. The inhabitants, though of French origin, had so frequently changed masters during the last century, that they were attached to nothing but their independence. The North Americans were by no means pleased to see us in possession of the mouths of the Mississippi, and of their principal outlet in the Gulf of Mexico. They had even applied to France to grant their commerce and navigation advantageous conditions of transit in the port of New Orleans. If we were determined to keep Louisiana, we might therefore reckon on the greatest efforts on the part of the English against us, on perfect indifference on the part of the inhabitants, and on positive ill-will on the part of the Americans. These latter, in fact, wished to have none but Spaniards for neighbors. All the colonial dreams of the First Consul were dispelled at once by the appearance of the message of King George III, and his resolution was instantly formed. 'I will not keep,' said he to one of his ministers, 'a possession which would not be safe in our hands, which would perhaps embroil me with the Americans, or produce a coldness between us. I will make use of it, on the contrary, to attach them to me, and to embroil them with the English, and

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raise up against the latter enemies who will some day avenge us, if we should not succeed in avenging ourselves. My resolution is taken; I will give Louisiana to the United States. But as they have no territory to cede to us in exchange, I will demand a sum of money towards defraying the expenses of the extraordinary armament which I am projecting against Great Britain.' The First Consul * * * directed M. de Marbois to send, without losing a moment, for Mr. Livingston, the American minister, and to enter into negotiation with him about Louisiana. Mr. Monroe had recently arrived in Europe to settle with the English the question of maritime right, and with the French the question respecting transit on the Mississippi. On his arrival in Paris, he was met by the unexpected proposal of the French cabinet. He was offered not certain facilities of transit through Louisiana, but the annexation of the country itself to the United States. Not embarrassed for a moment by the want of powers, he concluded a treaty immediately, subject to the ratification of his government. * * * The treaty was therefore concluded on these bases, and sent to Washington to be ratified. In this manner the Americans purchased from France that extensive country which has completed their territory in North America, and made them masters of the Gulf of Mexico for the present and for the time to come. They are consequently indebted for their birth and for their greatness to that long struggle between France and England."

And he might have added, they were directly indebted for such greatness to an outbreak, in a foreign territory, of a disease which should have been foreseen, and even in those days was known to be largely avoidable through quarantine and the evacuation of disease centers.

It is interesting to follow the fate of the St. Domingo expedition, in which nothing had been left undone which made for military success, save the consideration and care of the health upon which alone can such success ever be justly anticipated. Martin, in his "History of France," page 193, summarizes as follows:

"The first consequence of the war was the loss of San Domingo. English squadrons went to the aid of the blacks against the remnant of French troops, and after an obstinate and vain struggle, the last posts of French San Domingo yielded, and the

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ships which tried to escape with the few remaining troops fell into the hands of the English, or were swallowed up by the sea. In this wicked and unreasonable attempt to restore the old colonial rule, twenty generals and more than 30,000 men perished."

And Thiers says: "The veteran soldiers of the Rhine had nothing to fear but the climate. That alone could conquer them; that alone did conquer them; for they fell only beneath the sun of St. Domingo and the frosts of Moscow."

That this vast military movement of France had as its ultimate aim the checking of the westward expansion of the United States cannot be doubted. In corroboration of this purpose of Napoleon, Semple ("American History and Its Geographic Conditions," page 101) says: "In 1802 the King of Spain prohibited any grant of land to a citizen of the United States"—an action undoubtedly instigated by French influence and directly intended to prevent Anglo-Saxon immigration and its possible political complications and consequences." Napoleon took no chances, though he was even then actually shipping over seas toward the danger point a larger force of veteran regulars than the United States was even threatening to raise of untrained militia, necessarily largely to be recruited east of the almost pathless Appalachians. He had planned to take and hold the Louisiana country for France with a force in position far stronger than any which could have been sent against him—and the jealous monarchies of Europe after the downfall at Waterloo would scarcely have turned over to the American Republic an area to which the latter would have had neither moral, legal nor military claim.

From the foregoing, it does not require a Solomon to deduce the tremendous results to our then infant country as beneficiary of that neglect of military sanitation by France in 1802 on the relatively unimportant island of San Domingo—effects which have now been in process of development for more than a century in the complete alteration and expansion of our national destiny, and the ultimate future results of which are even yet beyond the vision of the keenest imagination.

To better emphasize the magnitude of these effects, it will be

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important to quote briefly from Austin's "Steps in the Expansion of our Territory":

"France, it will be remembered, had originally claimed the valley of the Mississippi by reason of exploration. Her war with England which grew out of this claim resulted unfavorably, and when it became apparent that she must give up her American territory, she had in 1762 ceded to Spain, in return for certain assistance which that country had given her in that war, the territory claimed by France, lying west of the Mississippi River and with it a small area lying on the east side of the Mississippi just above its mouth known as 'the Island of New Orleans.'

"It was a low, swampy region, but its importance lay in the fact that its ownership by the nation which also held the country on the west bank of the Mississippi gave to that nation absolute control of the mouth of the Mississippi, and would enable it to determine at its pleasure whether the commerce of the United States should pass in and out of the mouth of that great stream.

"This was an extremely important question to the United States as a whole, and especially to the low section west of the Alleghanies, in that day when water transportation was the only method by which its products could be carried to the seaboard. An agreement had been made in 1795 by the United States with the Spanish Government which thus controlled the entrance to the Mississippi, by which the citizens of the United States might deposit their merchandise at New Orleans and export it thence without paying any other duty than a fair price for the rent of the buildings in which it was deposited. This agreement, made by treaty in 1795, also provided that at the expiration of the three years for which it was drawn, the privilege should be renewed, either at New Orleans or some other point on the banks of the Mississippi, and at the expiration of the three years a tacit permission continued.

"In the year 1800, however, the Spanish government secretly ceded the Louisiana territory, including the island of New Orleans, back to France, with which the relations of the United States were not altogether satisfactory. When this cession became known, in 1802, great alarm was felt in the United States lest the French Government might terminate the privilege by

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which the people west of the Alleghanies had this free outlet to the Gulf of Mexico, and in October of that year the Spanish officer who was still in charge at New Orleans announced the termination of the privilege of deposit. Resolutions were introduced in Congress authorizing the President to call out 50,000 militia and take possession of New Orleans, but a substitute was adopted appropriating $2,000,000 to be used in the purchase of New Orleans, and James Monroe was sent to Paris to co-operate with our minister to France, Mr. Livingston, in negotiations for the purchase of the island and city of New Orleans. By the time of his arrival the relations between France and England had become such that a war between them was probable, and Napoleon, seeing that the defense of his new territory in America would be difficult, decided to offer to sell the whole of it to the United States, preferring to sell it to this country rather than lose it to his enemy, England. The offer resulted in an agreement by the American commissioners to purchase the entire area known as Louisiana, in the form ceded by France to Spain in 1762, and receded by Spain to France in 1800. * * *

"The area of the Louisiana territory thus purchased in 1803 for $15,000,000 was, as recently estimated by the Commissioner of the General Land Office, 883,072 square miles, or slightly more than that of the entire United States when the purchase was made, the national area prior to that time having been 827,844 square miles. Thus, in this single purchase the area of the country was actually more than doubled. A right to the permanent use of the waters of the Mississippi to the Gulf was thus assured. * * * The territory thus obtained is greater in area than Great Britain, Germany, France, Spain, Portugal and Italy combined, and from it were subsequently formed, in whole or in part, fourteen States and Territories, which had in 1900 a population of 15,000,000."

Had France, then the first military nation of the world, been able to once establish its authority in Louisiana—and as was projected in the adjacent Floridas also—supported by a powerful garrison of trained and veteran soldiery more than able to repulse any aggression from outside, there is every reason to conclude that such well-defended territory would have been permanently

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retained by her up to the present time, as Guiana and the French West Indies have been so retained.

Hemmed in between the British possessions on the north, the Atlantic ocean on the east and such French possessions on the south and west, the territorial expansion of the infant Republic of the United States could never have extended south of Georgia, or west of Illinois or Tennessee. Blocked by strong French military power and Latin civilization, the steady movement of the intrepid Anglo-Saxon, American pioneers would have been abruptly checked at the natural boundary line of the Mississippi. History and the map of the world would have been changed and the United States would at present be a relatively insignificant power geographically, numerically and politically; for even the present development and prosperity of the original area which this country possessed at the close of the Revolutionary War has largely depended on expansion and development of new territory and resources to the westward and the tremendous immigration thus brought about.

It is of advantage to consider briefly some of the further progressive steps in our expansion; which steps, it must be mentioned, were possible only as they were taken in an almost unoccupied wilderness unopposed except by savages and without coming in conflict with any military or political power worth considering. We may note here that in spite of an earnest and constant desire to acquire Canada, and in spite of her relative weakness, we have not in a century and a quarter, through her support by England, been able to acquire a foot of her territory by force or purchase; and the movement of our pioneers, deterred only by an arbitrary political line, has swept by the rich lands and resources to the north as something beyond reach, and has thus failed to secure our northward expansion by the peaceable means of there developing American ideals, institutions, government, and sentiment hostile to a foreign jurisdiction. Certainly it is reasonable to assume that the same would have been true with respect to the vast possessions of France across the wide waters of the Mississippi, whose people, supported by even greater military power and national prestige than that which had deterred any movement toward Canada, would have been reinforced in

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their opposition to peaceable absorption by the powerful additional factors of racial differences, customs and dislikes, different language and different ideas as to religious worship.

In 1810, West Florida, now part of Alabama and Mississippi, left in the feeble hands of Spain as a result of the French reverse in San Domingo, declared itself an independent state and was promptly taken under the jurisdiction of our government. No such movement by the Floridians would have been possible under the strong rule which France would have substituted, nor would the United States at that time have dared offer such a *casus belli* to such a powerful opponent as the foremost European military power.

In 1819, East Florida was purchased, after having been twice invaded by armed forces under General Jackson, whose high-handed actions Spain was powerless to resent. Such conditions and aggressive action would have been impossible with powerful France entrenched along the line extending from Jacksonville to New Orleans, and from New Orleans to Manitoba.

In 1845, as a result of the restless and practically unopposed western movement of the American pioneers, Texas passed from the position of an independent Republic to that of a state in the Union. "The area of Texas as admitted was 389,795 square miles, or nearly one-half as large as the Louisiana Purchase. * * * The area so purchased now forms the eastern half of the Territory of New Mexico, and parts of Oklahoma, Kansas, Colorado, and Wyoming."

It is a fair conclusion that with France in possession of what is now Louisiana, Arkansas and Missouri, the flow of Americans across her territory into Texas would have been utterly insignificant, and that the destiny of Texas would have rested in the hands of the French civilization and power developing on its eastern border in greater Louisiana.

In 1846 came the organization of the Oregon Territory, which includes the present states of Oregon, Washington, Idaho and parts of Montana and Wyoming. Irrespective of the various titles claimed for this country through exploration, the real title and the final result rested in the fact of its actual occupancy by Americans—and this occupancy depended entirely upon the

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previous cession of the Louisiana Territory and unhampered right of way for American settlers across the continent. It is idle to assume that Americans would have developed the Oregon trail if American sovereignty had stopped with the western edge of Illinois. This honor and the territory which it opened up would have been French; the history of whose explorers, pioneers and settlers on this continent shows them unsurpassed in these respects.

Then came the Mexican War, with the cession in 1848 of the territory west of Texas and south of Oregon, forming California, Utah, Nevada, most of Arizona and parts of New Mexico and Colorado. In three years the United States had thus acquired all the land between the Louisiana Purchase and the Pacific Ocean and increased its area by fifty per cent. There can be no doubt that had the original Louisiana remained French, there would have been no annexation of Texas by us, no settlement of Oregon, and no war with Mexico or even reason for a war. This latter also applies to the Gadsden purchase in 1853, which rounded out the areas of New Mexico and Arizona.

On the extension of our sovereignty to the Pacific absolutely depended our later acquisition of Alaska, the annexation of Hawaii, and the carrying of war to Asia which gave us the Philippines and has opened up to us military, commercial and political problems the vastness of which human mind cannot measure or foresee the end. It gave us the opportunity of becoming a world power, but with the grave obligations and responsibilities attaching to the struggle for the mastery of the Pacific and the commerce of the Orient. In this new field of activity, these territorial acquisitions make for commercial strength and military weakness. Such being the case, it is not likely that our possession will continue unchallenged.

Had France secured and held Louisiana and the Floridas, yellow fever and administrative conditions in the Spanish Antilles would have been of practically no importance to us as a nation and their slight interference with our trade would not have proved one of the deciding reasons for our intervention in Cuba and acquirement of Porto Rico.

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Had we no interests on the Pacific or Gulf of Mexico, this country would not now be cutting the Panama canal, and a century of confinement between the relatively pent-up frontiers outlined after the Revolutionary War would undoubtedly have largely destroyed that quality of restless initiative and desire for expansion for which we are, as a people, noted.

As to the probable future of France in America, had she finally established her power on our continent, as Napoleon had planned and had at one time the military strength west of the Atlantic to enforce, and which nothing but epidemic disease finally prevented, our present entire territory west of the Mississippi would undoubtedly have been in her hands and our present destinies in the Pacific would have been hers by inheritance. With the internal disturbances of Mexico, the French intervention of 1867 would unquestionably and frankly have taken the form of a permanent sovereignty rendered necessary by the contiguity of her own territories of greater Louisiana. And once established in Mexico, with a French company later at work on the Panama canal, it is not too unreasonable a speculation to assume that under her general policy of colonial expansion her power would likely have gradually extended down to the isthmus through the turbulent and weak countries of Central America. With a French empire in Louisiana, there could never have been an effective Monroe doctrine nor would one have even been enunciated.

To sum up, in the light of subsequent history the political, geographical and material development of our nation and country has hinged upon camp epidemics, which brought military movements of vast ultimate significance from every assurance of success to complete disaster. These diseases were preventable, and even with the lesser knowledge of the time they could have been prevented or their effects largely minimized.

We must not forget that history not only repeats itself, but does so with mathematical certainty where nature's laws of living are disregarded. Camp epidemics of disease are not merely occurrences lamentable from the humanitarian standpoint—they are often epochal crises in the fate of armies and the destinies of nations.

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DISCUSSION.

Surgeon General C. F. Stokes, U. S. N., said that he had not had the pleasure of attending meetings of the Association for some years. Therefore, he might be too enthusiastic in respect to the value of the papers read at the present meeting.

"We all recognize the military importance of sanitation. Of late I have been making a special study of the mental conditions in the personnel of the services; that is to say, of the psychology of the sailor and the soldier. It is worthy of note that 2,000 men in the Russian forces at Port Arthur were suffering from insanity at the time that fortress fell. It is my belief that the study of the psychology of men in the military service should be combined with the study of sanitation. Certain mental attributes are essential for the performance of certain duties in the Navy. For example, it is obvious that in the operation of a turert, or in gun-pointing, if men are introspective or temperamentally unfit they cannot perform their duties. It is clear, too, that it is an obligation of the medical department to prevent men of this class from being put in positions where their unfitness debars them from rendering efficient service."

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THE MASTER KEY IN SANITATION*

By Assistant Surgeon General W. C. RUCKER, United States Public Health Service.

THE generation in which we live has been remarkable for the enormous impetus which has been given to the movement for the creation, protection, and continuance of the health of man. We have been, so to speak, laying the foundation of the public health edifice throughout the ages. This basic structure finds expression in the Bhagavat Purana and the Mosaic law, and we have been learning in the school of bitter experience a few simple facts, the scientific explanation of which has engendered our present efforts. The foundation of this public health edifice is solid and time-enduring, and we are even now building the superstructure which is to rest upon it. This is an edifice of many, many rooms. Some of the doors which guard these rooms have been unlocked by tireless and self-sacrificing workers. Many of the doors are still unopened, and it seems as though we were in need of the key which will open every door which guards the secret of the prevention of the spread of disease from or to the human race.

Let us in our search for this key stop and consider a few of the more important facts in the evolution of the protection of the health of the individual. Every one is familiar with the excellent rules laid down in the Mosaic Law. Unfortunately, these were applied for a long period of time to a single race only, and we need go no further back than the year 1000 to observe how singularly these wise precautions were honored in the breach rather than in the observance. Imagine, if you please, the interior of a baronial castle of that period. It is cold, and dark, and damp. The air is filled with smoke which the poorly constructed fireplace belches into the room. The floor is covered with rushes which abound in fleas and the excrement of numerous dogs. Down the center of the hall runs a great table, flanked by rude

*Read at the 21st Annual Meeting.

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benches. There are no knives or forks; there are no plates or dishes; there are no drinking vessels, but every hand is dipped into the trencher, and everybody drinks from his neighbor's horn.

At this time there was no such thing as a sewage disposal system. As a matter of fact, there were no paved streets in the cities of England until the time of Henry VIII. In these cities, the second stories of the houses were extended over the sidewalk, and the houses themselves leaned toward the center of the street. This style of architecture invited the simple expedient of emptying night soil into the center of the street, and it was for this very purpose, and the protection of foot passengers from the materials discharged from the second story, that houses were so constructed. At that time, so historians tell us, it was the favorite jest to get the most intoxicated man of a midnight crowd of roisterers on the outer edge of the sidewalk and at the proper time to give him a shove which would land him in the noisome filth.

In those days the inns were in worse condition than the ordinary stables of today. At night each weary traveller gathered up a bundle of rushes from the floor, spread out his cloak, and, lying down upon it, went to sleep (the strongest nearest to the fire), thus virtually converting the room into a vast bed, affording ample opportunity for the interchange of ecto-parasites. To illustrate the frequency with which the people at that time harbored these verminous companions, may be related the story of the man who came before the French court, and stated that he could train lice to do certain tricks. In proof of this he abstracted, with great deference and respect, one of these tiny creatures from the head of the King, and another from the coiffure of the Queen, and then and there trained them, to the great pleasure and delectation of the entire court. But bye and bye, the ruder customs of life began to be dropped, and tablecloths were introduced. These were made long so that they overhung the ends and sides of the table, and thus served for wiping the mouths of the voracious diners. In those good old days there was no such thing as a weekly wash day. Clothes were worn until they became too filthy for further use, and then they were made a part of the collection which was being reserved for the biennial festival of wash day.

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Now there is one word which describes this condition, and that word is "promiscuity." In the past when promiscuity ruled, plague, once introduced, swept through the land like wild-fire. Think of the number of rats which the ancient castles harbored, and the excellent opportunity they had for securing food, and you will see why it was that 25% of the people of Europe perished from plague in the outbreak which occurred in the fourteenth century. How easily could a single cholera or typhoid carrier infect every person who dipped his hand into the trencher with him. Consider the promiscuity with regard to the sexual habits of the day, and it is no wonder that syphilis ravaged Europe in the fifteenth century. At that time the people were careful in their religious observances, and one is led to wonder how much disease was spread by the communion cup, until the Church in its wisdom took it from the people. This was the first movement toward the abolition of the common drinking cup, and it was the beginning of the coinage of the word which is the master key in the sanitary edifice, the word which will unlock any door in the prevention of disease, which will open the way toward the prevention of all the communicable scourges, is this master word. This word is non-promiscuity. If you will but think of the modern sanitary movement in this light you will see that its entire aim and purpose has been to get away from promiscuity, and to approach the state of non-promiscuity, which may be defined as the state of being un-promiscuous. What is the abolition of the common roller towel, and the public drinking cup, but a manifestation of this? Isn't the nine-foot sheet an avoidance of promiscuity with other people through the avenue of blankets? What is the hookworm eradicative campaign, but the getting away from promiscuity in the matter of the disposal of human discharges? Similarly the prevention of typhoid means not only non-promiscuity in this regard, but also in the matter of flies and dirty fingers. The prophylaxis of bubonic plague is an attempt at the abolition of promiscuity with the rat, while the battle against yellow fever and malaria aim at the avoidance of promiscuity with other individuals through the intermediation of the mosquito. The same may be said with regard to the extermination of lice as a means

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of exterminating typhus, or the killing off of ground squirrels for the suppression of Rocky Mountain Spotted Fever. It was promiscuity with goats which made possible the spread of Mediterranean fever, just as it was promiscuity with unvaccinated individuals which has made possible the continuance and spread of smallpox. The Egyptians, the Hebrews, and the Europeans of the middle ages recognized this in the measures which were taken for the prevention of the spread of leprosy. The cloaked and hooded sufferer walking through the streets was obliged to warn all passers by ringing a bell, and crying "I am unclean, I am unclean." The anti-tuberculosis movement is aimed directly at the avoidance of promiscuity with phthisis patients, and non-promiscuity with regard to the common communicable diseases such as measles, röthelen, chickenpox, and smallpox is covered by this word. Similarly quarantine, the isolation of persons having communicable diseases, and the weeding out of the physically unfit through the examination of immigrants, are all measures of non-promiscuity. The best example which could be cited, however, of the application of this master word is the adoption of venereal prophylactic methods, and the dissemination of the gospel of sex hygiene. Considered from the standpoint of mental hygiene and eugenics, we have even a broader application of this key word.

How shall we use this master key to all the rooms in the edifice of sanitation? It would appear as though this simple word might be of great benefit to us who are responsible for the health of the military, naval, and civilian community. Non-promiscuity is the basis of the maintenance of health in troops. Is it any wonder that the Crusaders were unable to rescue the Tomb of Our Lord from a handful of infidels when we consider the frightful promiscuity of their camps, and does it not seem as if typhoid fever could be striken from the list of inevitable accompaniments of war by the adoption of the principle of non-promiscuity? Promiscuity was as great an evil on the Roman triremes as it is on the modern battleship, and the rules laid down by Elda the Wise for the sanitation of the Norsemen's galleys are equally applicable to the super-dreadnought of today.

In ancient days sanitary reforms were brought about by

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making their raison d'être a religious principle. Thus we find the Egyptians deifying the cat, the destroyer of the vehicle of plague; we see them conferring sacredness on the scarab because that beetle is the industrious destroyer of feces and the foe of the hook-worm; we have the ritual of hand-washing of the Jews, the ceremony for the purification of the unclean; oral hygiene is a matter of the religious belief of the Brahmas, and even the most ignorant Indian tribes will not befoul a spring because it is an insult to The Almighty. Non-promiscuity had its beginning in the Church, and it should be made a part of our work-a-day religion, not the religion which worships a God through the intermediation of stained-glass windows and a Prince Albert coat, but the real practical religion, the protection of the body of man as the temple of God from desecration. It is our bounden duty to create in the persons committed to our care a sanitary conscience, and after all is said and done, what is a sanitary conscience but the incarnate spirit of non-promiscuity.

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NOTES ON A TOUR OF DUTY WITH A BATTALION OF MARINES ON THE ISTHMUS OF PANAMA.*

By Passed Assistant Surgeon J. G. ZIEGLER, U. S. Navy.

UNDER ordinary circumstances, the subject of this paper is one that might not appeal to the members of this Association, but in view of the intention in the near future of the occupation of the Isthmus by the Army, it is believed a discussion, in a military sense, of conditions found there would be timely and of some interest. It is true that the Canal Commission has issued plentiful literature on sanitary conditions as affecting the Canal Zone, but this has of necessity dealt with the subject as having to do with groups of civil communities and not with a body of men under military rule and discipline. Of course, it is admitted that there is a close analogy between two such classes of people, but in the cases of troops the men as individuals are under closer supervision and control, and, moreover, they do not possess the privilege of voluntary resignation.

Since 1903, a battalion of U. S. Marines has been stationed on the Canal Zone, the actual numerical strength varying from time to time; but the period covered by this paper began September, 1909, and has more especially to do with the period extending from April, 1910, the time of arrival of the present battalion. The later period has been selected because the statistics available are both complete and reliable. The great majority of the present command on their arrival here were new, not only to the Tropics but to the service, being recruits fresh from the States, many never having, before enlistment, been away from their home surroundings. There was nothing remarkable about the men as individuals, they being the same as the ordinary run of recruits, but there was one noticeable point, taking them collectively, inasmuch as they are nearly the same height, averaging 68 inches, this fact enhancing their appearance when on parade or review. The average weight per man was 152.03 pounds, and the aver-

*Read by title at the 20th Annual Meeting.

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age chest expansion 3.83 inches. Some of the men were naturally robust and strong; some were muscular but flabby, and some were of rather poor physique. The immediate problems presented were to train these men, to adapt them to the conditions of their environment, and, if necessary, weed out the physically unfit and mentally or morally undesirable. In furtherance of such a policy it was necessary to engender a spirit of contentment among the men, to subject them to certain physical tests and to safeguard them from disease by instructing them as to personal hygiene and by rendering healthful and sanitary their immediate surroundings. How well these efforts have succeeded, in part, may be shown by relative statistics as embodied in the accompanying table showing the percentage rate of sick for the years from 1906 until the present, the figures for 1911 being for the first six months:

1906	7.37% or 73.70 per 1,000
1907	4.11% or 41.10 per 1,000
1908	3.47% or 34.70 per 1,000
1909	2.02% or 20.20 per 1,000
1910	1.41% or 14.10 per 1,000
1911	1.04% or 10.40 per 1,000

At this point it is well to say that to get results it is necessary for the Medical Officer to have the close co-operation and assistance of the Commanding Officer, for unless the sanitary regulations can be enforced they are useless.

As soon as possible after their arrival in camp each member of the battalion was given a complete physical examination, while stripped, and notes made of any physical defect or deformity, especially such as were capable of correction, and the men were given to understand that a similar examination would be made once a month. These later examinations were more cursory, but were compulsory and they tended to avoid any concealment of disease, especially of venereal origin, and furthermore increased the confidence of the men in the Medical Officer, since they appreciated that the work was for their own benefit.

It can be easily appreciated that to secure contentment among the men of the command was of first importance. Being re-

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cruits and new to the Tropics, their surroundings were at first sufficiently novel to induce an interest, but such novelty, unsupported, soon wears away and unless other provision is made to maintain interest it is soon succeeded by the mental depression due to acute nostalgia. It must be understood that owing to service conditions these men would be unable to enjoy the six weeks' yearly vacation in the States allowed Canal employes, but must remain continuously on the Isthmus for a period of at least two years. Accordingly the men were from the beginning encouraged to regard the camp as a more or less permanent home, and as such induced to take an interest in increasing its attractiveness. One of the first things done was to secure volunteers for a band, which, after a short season of preliminary practice, was used at parades, guard mounts, and reviews, and in addition gave a daily evening concert. The amount of pleasure secured from this source is incalculable, and the band more than any other agent has been the means at numerous times of relieving the monotony that is invariably associated with routine military life.

Plenty and easily accessible means of recreation were afforded. For the use of the athletically inclined, particularly during the wet season, there is a fully equipped gymnasium, and such men as needed it were given special instruction in systematic exercises intended to improve their physique. The gymnasium also contains a bowling alley, pool tables, a shooting gallery, and portable stage whereon theatrical performances could be given by the men themselves or by traveling entertainers; and furthermore, through the medium of the Post Exchange, a moving picture machine was purchased and pictures shown three times a week. For outdoor recreation there is a hand ball court, a tennis court, and baseball teams were organized by the various companies, a spirit of friendly rivalry being encouraged. With the same object in view occasional athletic tournaments were arranged and prizes provided out of the Post Exchange funds. Such men as are in the good conduct class are allowed at intervals a five-days hunting pass, the surrounding country being well stocked with game, and are furnished with the necessary guns and ammunition.

All these facilities for recreation and exercise were, however, only some of the various means toward a definite end—the con-

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version of each man into a perfect, thinking, fighting-machine capable of acting either as an individual unit, or in unison as a battalion. Their object is to induce content, which in turn favors happiness and health—and the good soldier is the healthy soldier.

One of the fundamental requirements of a soldier is an ability to march, a requirement of great importance both in an advance and a retreat. Without such ability a soldier, no matter what are his other qualifications, is unfit for the service. There is no better method of determining a man's ability to march than to have him march. Accordingly, during the dry season, each company commander took his company for a weekly "hike." At first the distances were short and the men lightly accoutered, but later the distances were gradually increased and each man carried all the articles he would in time of actual service. These practice marches served to show up the weaklings and defectives, particularly those suffering with flat feet and varicocele. Cases of the latter trouble were cured by operation. All the flat-feet cases were given discharge by medical survey after being kept under observation a sufficient time to eliminate any suspicion of malingering; because our experience has shown that those cases do not improve with time, but grow worse and are not benefited to any material extent by support with artificial arches.

Of about equal importance in getting rid of the physically unfit, is the advisability of ridding the command of the mentally deficient and the morally undesirable. The former class embraces the men who are usually the good-natured butts of their companions and who are incapable of training. These men are best discharged by medical survey. Of the morally undesirable there are two classes—those who are positively bad, who are always seeking trouble, and those negatively so, inasmuch as they cannot resist temptation. In this command the majority of the former were run out of camp by their decent companions, and the latter were given a chance to reform under a penalty for failure of bad conduct discharge by sentence of summary court.

Having thus started off with what might be termed a healthy battalion, it remains to tell what efforts were made to maintain its health. This involves a general discussion of the Isthmus as a

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habitation for enlisted men from the States, and a more specific discussion of the camp itself.

While I cannot speak from actual experience, I believe that the Isthmus cannot be compared, with fairness, to the Philippines or our other foreign possessions in the Tropics. The reason is not apparent, but is probably due to the fact that though a tropical country there is as much or more activity in a business way as there is in the States, a condition incident to the building of the Canal. The true cosmopolitan air of the East is lacking, there are no real large cities with their varied amusements, and it is a certain source of dissatisfaction to the enlisted man to be in daily contact with fellow-countrymen of his who are earning six times his pay and who have the privilege of returning to the States six weeks in every year. This association and knowledge combined with occasional periods of mental depression induced by long spells of bad rainy weather causes, after a time, in the more susceptible, symptoms which are broadly grouped under the term of "tropical neurasthenia." Personally, I believe that the tropics have little to do with it, and that a similar condition in any foreign station would exist regardless of climate, if like circumstances were present.

The camp itself is situated on the top and sides of a hill having an elevation of about 250 feet above sea-level. In this respect it is like most the communities of the Isthmus since the general character of the land is hilly, and of about the same elevation except for an area running east from Panama, which is a rolling prairie or savanna. This elevation simplifies the problem of drainage, though the soil itself is very permeable and water standing after a rain is quickly absorbed; and gives greater exposure to the winds with consequent better circulation of air and ventilation.

The barracks consist of shacks, averaging 54x24x14 feet in size and each contains on an average of 24 beds, giving approximately 756 cubic feet of air space to each man. Each shack is well screened and contains plenty of windows so that air has easy access, and by virtue of the constant breezes the contained air is frequently renewed. Each shack is fitted with one toilet and a shower-bath of modern sanitary construction. Experience

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has proven this provision to be ample. As a provision against ants, which are very destructive if unchecked, the floors are swabbed twice a week with a 50% watery solution of kerosene oil.

During my stay two systems of rationing the men have been used, by a general mess and by company messes. The latter is the method used by the present battalion. The company mess has been the more satisfactory, particularly since a spirit of friendly rivalry is engendered between the different company cooks and mess sergeants, as a result of which the quality and variety of food are improved. No special diet has been used, the ration being virtually the same as that in use in the States. Because of an excellent commissary maintained by the Panama R. R. there is little difficulty in securing fresh food of all kinds. A bakery belonging to the post furnishes excellent bread, the baking being done by men detailed from the command.

The water used for drinking purposes is all distilled. No diseases have been traced to this source. The water for shower baths and flushing purposes is piped direct from the reservoir. At certain seasons of the year this water has a bad odor which is due to decaying vegetation along the banks of the reservoir, but despite the odor it is apparently harmless and has never caused disease.

The men wear the regulation khaki uniforms with leggings and the regulation felt hats. Helmets were tried but discarded. The regulation shoe furnished by the Marine Corps has proven satisfactory.

During the period under discussion the main causes of disease in relative order of importance were malaria, venereal infections, skin troubles and alcohol. Most of the men whom the first physical examination showed to have enlarged tonsils suffered at various times with tonsilitis, and in a number of cases added to the sick rate because of operations for enucleation. In a similar manner there were sick days due to operations for the relief of phimosis or varicocele which had existed prior to enlistment.

During this period there have been no deaths from disease and in the case of the present battalion no deaths from disease or accident since they entered camp. On the night of entry one man

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was killed by a train. Of the few deaths that have occurred all have been the result of accident, either on the railroad or by drowning, and in most cases directly traceable to over indulgence in alcoholic intoxicants, or to disobedience of post regulations. There has never been a death from malaria at this camp, which is remarkable, since some very severe cases have been treated and some cases of hemoglobinuric fever. In the last two years there has been recorded no cases of sunstroke or heat exhaustion and no proven case of tuberculosis. Colds in the head are not uncommon, but are not disabling and do not show on the sick rate.

The following sanitary proceedings and prophylactic precautions are observed:

The drinking cups in all the shacks are kept constantly submerged in a ½ of 1% solution of formalin. The solution is colored by a little fuchsin to avoid substitution of ordinary water by men who would desire to avoid a trip to the sick bay. This is as a prophylaxis against mouth-borne diseases.

As a prophylaxis against venereal diseases all men suffering with tight or redundant foreskins are offered circumcision. This is usually accepted. The system of prophylaxis used throughout the U. S. Navy is adopted here, and should it be proven a man who contracts venereal disease had not taken the treatment he is punished by a summary court. Our experience has shown that all the cases of venereal diseases that developed here could be traced either to an anatomical defect as phimosis or venereal warts, or delay in taking the treatment, disease being most apt to occur when both factors were combined. So far but one case of syphilis has originated here, though the treatment does not always prevent chancroid or gonorrhoea. These diseases seem particularly virulent at times and are usually of a very short incubation.

As a prophylaxis against skin diseases the men are urged to change their clothes whenever wet or perspired and to use dusting powder freely. They are given plenty of opportunity to wash their clothing, but are forbidden to dry it by placing it on the ground; they must hang it upon lines provided for that purpose. The skin troubles are all of the parasitic variety, mostly tricho-

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phyton infections with occasionally trouble from ticks and mites. Scabies is rare. Sunburn occurs occasionally, but considering the number of men who work with parts of their bodies exposed it is peculiarly rare.

Malaria is the bane of the Isthmus and without it the sick-rate would be almost nil. For three months after the arrival of the battalion at camp, each man was given five grains of quinine daily. This was made compulsory. After that time this daily taking of quinine became voluntary with those who did not contract malaria, but for those who became infected it remained compulsory during their stay on the Isthmus. The liquid preparation is given and at times causes strenuous objection. All sorts of excuses are advanced to be excused, but unless it is really a bona fide case of intolerance or of hypersensitive stomach their excuses are usually met and the matter terminated by offering to give it to them by hypodermic injection.

Other prophylactic measures directed against this disease consist of keeping the camp thoroughly policed, the grounds well drained, and the barracks well screened, prompt repairs being made when indicated. It is forbidden to allow the doors of the barracks to remain open after nightfall. The Medical Officer and the Officer of the Day make a daily inspection of camp, and the latter records as a routine measure the presence or absence of cans or vessels containing standing water. Once a week the Commanding Officer very thoroughly inspects the camp in company with the Medical Officer. The grass is kept well trimmed. This at first was done by general police parties, but is now done systematically and routinely by prisoners, the camp for this purpose being divided into sections and each section being gone over in order. Frequent search is made for probable mosquito breeding places and, if found, they are destroyed or oiled. There is a regular weekly oiling of the camp and over many drains automatic oilers are placed which automatically supply oil, drop by drop. All garbage is collected twice daily and promptly incinerated in a closed incinerator having a smoke consuming device. Dead grass, trash, etc., is burned over an incinerator improvised from an old French dump car, and which serves its purpose well. As an additional precaution there is a daily trapping of mosquitoes

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found in the shacks, by a hospital corps man specially trained for that purpose. Of not the least importance is the prompt removal to the sick-bay of any person affected. Our routine treatment of an attack consists in administering a laxative of three ½ grain calomel tablets at periods of half an hour, followed by magnesium sulphate and then quinine in ten grain doses four times a day. If this does not reduce the temperature or there is undue gastric irritability or grave symptoms due to excessive temperature, quinine by mouth is discontinued and given intramuscularly in 20 grain doses t. i. d. We have never any abscesses nor black water due to quinine and in only one case did we experience a quinine rash. The following table, taken from the article by Drs. James and Deeks on Hemoglobinuric fever in the Canal Zone, was compiled from statistics of this camp:

	1903	1904	1905	1906	1907	1908	1909	1910
Average annual strength	298	444	207	253	182	409	397	387
Cases of malaria	126	262	156	796	378	452	189	41
Percentage of malaria	42	59	75	331	202	173	48	10.6
Annual rate per 1,000 of malaria	422	590	753	3,315	2,022	1,733	476	106
Cases blackwater fever	0	0	0	0	0	1	0	0

No cases of typhoid have arisen among the members of the battalion, though during January, 1910, two cases were treated that were traced to drinking soft drinks bought at a Chinese shop. We have had no experience with antityphoid vaccination, there having been no necessity therefor. The camp is virtually flyless, this being due to the prompt collection and incineration of garbage. Even the corral is free from flies. This is partly due to its construction, the floors of the stalls being made of portable wooden sections laid over a floor of concrete. Each day these wooden floor-sections are removed and scrubbed and the cement space underneath whitewashed with fresh slaked lime. This also destroys all bad odors.

As regards prophylaxis against the effects of alcohol little can be said. While it does not show frequently on the sick reports it is, nevertheless, the indirect cause of many sick days and not a few deaths. Nearly all the fatal accidents that occurred during the period under discussion occurred while the man killed was under the influence of alcohol. It is only recently that safe

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means have been provided of entering and leaving camp by road, it being necessary heretofore to walk along the railroad tracks, and there have been no accidents for a long time.

Alcohol further acts as an augmentor of the sick list by increasing the predisposition to disease by lowering the vital resistance, and thus are explained the majority of malarial recurrences, which are liable to show up after week-end liberty. The relation between alcoholism and venereal diseases is too well known to more than mention.

The policy with this battalion has been to strongly discountenance drunkenness. At first the offender is usually warned and given a good amount of extra police duty. Recurrences are punished by a deck court with loss of pay and extra police duty additional. This is the most effectual as a restraining influence. Persistent offenders are given a summary court-martial with bad conduct discharge. At present there are few such chronic offenders in the camp. It is believed that restoration of the canteen would not solve this problem. It was noticeable that after a fire at Bas Obispo, which destroyed all the liquor establishments in the town, thus rendering the securing of intoxicants more difficult and troublesome, the punishments for drunkenness decreased markedly.

During the stay of the present battalion the general health and physique of the men, as a whole, improved. True, some of the weaklings dropped by the wayside, as it were, and were lost by medical survey, but the general tendency has been for improvement. Today the raw recruits of eighteen months ago, comprising the awkward lads fresh from the farm and the pale-faced, world tired youth from the cities, have developed into well trained, intelligent, manly men, well trained and of robust physique. Their service in the Tropics has not hurt them, but done them good. Mere physical comparison proves this, since the average weight of the battalion is 153.54 pounds and the average chest expansion 3.97 inches; a decided increase since the time of their first physical examination.

The daily average of persons continually sick—non-effective rate—has been 5.7, and the daily average of persons constantly sick, per 1,000, has been 12.14—a much lower rate than for the

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white employes of the Canal Commission. The percentage of desertions has been but 3½%.

The following deductions have been drawn as a result of observation:

1. That the Isthmus as a place of habitation for a continuous period of no longer than two years is as healthful as most places in the United States. After two years there is a tendency toward physical deterioration and mental unrest which renders it inadvisable to increase the tour of duty beyond that term. Furthermore, our experience shows that the men will be more content if they can look forward to a tour of duty of a definitely fixed duration rather than one for an indefinite length of time.

2. That recruits, or men in their first enlistment, endure the Tropics best. There is, with few exceptions, no such thing as acclimatization for the white man, and prolonged stay in the Tropics tends to physical and mental deterioration. Most of our cases of neurasthenia and nervous troubles arose among the men with one or two former tours in the Tropics.

3. That to secure contentment it is necessary to provide means of amusement and recreation.

4. That a proper amount of work is not harmful, but beneficial and favors contentment; and that it relieves monotony and freshens the men, to alternate periods of drill with shorter periods of general police.

5. That the men stand best the regular ration in use in the States.

6. That our experience has shown that sunstroke or heat exhaustion is rare and harm by actinic rays mostly theory. The khaki uniform answers all purposes and is satisfactory.

7. That outside of malaria and certain skin infections other diseases peculiar to the Tropics are rare. We have gotten the best results in the case of malaria by using the method of prophylaxis and treatment as detailed previously.

We think the results we have obtained are satisfactory, but believe they can still be improved. No claim, however, is made for any specially original method of sanitation. The results obtained have been secured by a strict enforcement of discipline and a thorough understanding and cooperation between the

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Medical Officer and the Commanding Officer. The men have been kept contented and protected as far as possible not only from external influences but from evil tendencies having origin in themselves. They have been encouraged to regard the Commanding Officer and Post Surgeon as especially interested in their physical welfare and glad of their cooperation. Any infringement upon sanitary regulations is, however, severely punished. Contentment is induced by plenty of work, most of it being of a constructive character tending to improve their immediate environment, associated with plenty and easily accessible means of systematic exercise, amusement, and recreation.

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THE USE OF TINCTURA IODI IN THE TREATMENT OF BLISTERED AND ABRADED FEET.

By Captain GEORGE H. RICHARDSON, Medical Corps, N. G. California.

AT a recent weekly meeting of our hospital corps detachment, the use of tincture of iodine in the preparation of skin preliminary to surgical operations was discussed; and, in view of the beneficial effects that had been reported, it was decided that during the Joint Artillery Maneuvers to be held at the Presidio of San Francisco, California, in July, we would make a test of this preparation as a means of disinfecting all the superficial infections that came to the regimental infirmary.

Acting upon this plan, we found that few of the men reported for the cuts, burns and other slight traumas usually incident to the establishment of a camp, yet every morning at "sick call" five to ten men would appear complaining of blisters and abrasions of the feet. We therefore concluded to make use of the opportunity to determine whether tincture of iodine would be beneficial in the treatment of "sore feet," preventing simple abrasions of the skin from becoming ulcerated and hastening the cure where considerable inflammation existed.

It is needless to say that those of us who have had service in the field,—particularly tropical service,—learned to realize the importance of caring for any surface abrasion, however slight, which might appear on the feet of the men of our command, knowing that in the early days of a campaign more men are disabled and rendered inefficient on account of sore feet than from any other cause. This is essentially true of volunteers, who are usually unaccustomed to walking on rough ground; and it sometimes takes weeks to get them in condition for a long, protracted march.

Naturally, the cases which reported for treatment varied in character from a slight erythematous roughening of the skin to a neglected hyperaemic ulcer of several days' duration, and, while many of the blisters had already ruptured, several were found, of

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various sizes and locations, filled with the familiar serous exudate. At first we gave the abraded surface a preliminary scrubbing with soap and warm water; but later, in order to see results under conditions simulating those of actual service, we simply applied thoroughly over the affected areas, with a camel's-hair brush or cotton swab, the official 7% tincture of iodine, and allowed it to dry. In cases where the blisters had not ruptured, they were first painted and then incised by a sharp-pointed, sterilized bistoury, care being taken to enter the blister under and beyond its raised surface. After expressing the serum, the incision was given a second coating. In cases of simple abrasions of the superficial layers of the skin, no dressings, ointments or powders were applied, and the stockings were replaced, the men being told to report the following day. Those who reported were invariably well and needed no further treatment.

Where blisters had broken or ulcers had formed, some sort of protective dressing was found necessary, and for this purpose nothing seemed to surpass zinc oxide adhesive plaster, properly cut and fitted to the part. The method employed was taught me by a Civil War surgeon, and consisted of placing two or three small squares or layers of plaster together, folding on the non-adhesive surface, and cutting with scissors a circular opening slightly larger than the inflamed area it was desired to protect. Care should be taken that the pad is not too large or too thick and that it is applied without wrinkles. Where there was considerable exudate, we applied a few layers of gauze over the ulcer, being particular that they were not wide enough to prevent the plaster from adhering to the healthy skin. In this way all pressure from the shoe was overcome, thus preventing any direct, constant irritation which could interfere with the healing process.

It might not be amiss to say, in passing, that for inflamed callosities or bunions, adhesive plaster applied in the manner described gives immediate relief and renders a man capable of walking with comparative comfort.

I cannot give exactly the number of enlisted men and officers who came to the infirmary complaining of trouble with their feet, but am safe in saying that over 50% of the cases desiring any medical attention were of this character. Had we been in camp during hot, dry weather, with no facilities for washing the feet,

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the proportion would probably have been even greater. It would be interesting, in order to determine the amount of inefficiency due to infected wounds of the feet, and the benefit to be derived from the application of iodine, to treat cases alternately,—one with and the other without this preparation.

The cost per capita of preparing enlisted men for service, when we take into consideration all the details, is far in excess of what one would ordinarily think possible. It is therefore incumbent upon the Medical Corps to study every point which might improve the efficiency of the enlisted personnel, and it is with this in view that I submit this short article.

If our experience should be confirmed by a more extended trial and the preparation found to be of no other use than the treatment of superficially infected surfaces, I think the propriety of making it a component part of the Detached Service Chest and of the Orderly Pouch suggests itself as worthy of consideration.

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THE TWENTY-FIRST ANNUAL MEETING

BALTIMORE, MARYLAND, OCTOBER 1-4, 1912.

MINUTES OF THE MEETING.

THE Twenty-first Annual Meeting of the Association of Military Surgeons of the United States was held in Baltimore, Maryland, from October 1st to 4th, 1912. The following officers, members and delegates, and representatives of foreign nations were present.

OFFICERS.

President, Surgeon C. P. Wertenbaker, U. S. P. H. S.
First Vice President, Surgeon W. C. Braisted, U. S. N.
Third Vice President, Lieutenant Colonel J. R. Kean, U. S. A.
Secretary, Major Charles Lynch, U. S. A.
Treasurer, Major H. A. Arnold, N. G. Pa.
Assistant Secretary, Surgeon J. W. Richards, U. S. N.

MEMBERS AND DELEGATES.

Lieutenant Colonel Henry Allers, N. G. N. J.
Major Bailey K. Ashford, U. S. A.
Major Robert P. Bay, N. G. Md.
Captain Edward W. Becker, N. G. N. Y.
Captain R. B. Bennett, Jr., N. G. D. C.
Major William G. Bissell, N. G. N. Y.
Captain Herbert C. Blake, N. G. Md.
Major John J. Boaz, N. G. Ind.
Major Bial F. Bradbury, N. G. Maine.
Lieutenant Colonel Albert H. Briggs, N. G. N. Y.
Major Israel Brown, N. G. Va.
Captain W. Earle Chapman, N. G. Mich.
Assistant Surgeon Thaddeus W. Clark, N. G. Md.
Major H. Vance Clymer, N. G. Ariz.
Major Henry L. Cochran, N. G. N. Y., retired.

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Major W. S. Conkling, N. G. Iowa.
P. A. Surgeon Howson W. Cole, U. S. N.
Brigadier General George Cook, N. G. N. H.
Major Harold D. Corbusier, N. G. N. J.
Medical Inspector R. P. Crandall, U. S. N.
Medical Inspector L. W. Curtis, U. S. N.
Major S. Griffith Davis, Jr., N. G. Md.
Captain Henry H. Doan, N. G. Pa.
Surgeon A. W. Dunbar, U. S. N.
Surgeon S. G. Evans, U. S. N.
Lieutenant Colonel D. S. Fairchild, N. G. Iowa.
Captain Joel W. Fithian, N. G. N. J.
Major J. H. Ford, U. S. A.
Major Romulus A. Foster, N. G. D. C.
Captain Carroll H. Francis, N. G. N. J.
Lieutenant Colonel Edwin M. Fuller, N. G. Maine.
Brigadier General A. C. Girard, U. S. A., retired.
Major Charles S. Grant, N. G. Iowa.
First Lieutenant Howard A. Grube, N. G. Mich.
Lieutenant Colonel Joseph A. Hall, N. G. Ohio.
Major Arthur P. Hasking, N. G. N. J.
Major Frank W. Hendley, N. G. Ohio.
Colonel John Van R. Hoff, U. S. A.
Surgeon R. C. Holcomb, U. S. N.
Major Frank B. Humphreys, N. G. Ind.
Major Paul C. Hutton, U. S. A.
Major Arthur R. Jarrett, N. G. N. Y.
Major William Jepson, N. G. Iowa.
Major Clarence F. Kendall, N. G. Maine.
First Lieutenant Henry W. Kennard, N. G. Md.
Surgeon R. M. Kennedy, U. S. N.
First Lieutenant D. A. Kraker, U. S. A.
Assistant Surgeon C. C. Kress, U. S. N.
Captain Ernest C. Lee, N. G. Mich.
Major George P. Lingenfelter, N. G. Colo.
Captain B. M. Linnell, N. G. Ill.
Major Charles R. Luce, N. G. D. C.
Medical Inspector G. A. Lung, U. S. N.

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Captain R. S. McCaughey, N. G. Ill.
Surgeon F. E. McCullough, U. S. N.
Captain C. C. McElfatrick, N. G. Del.
Lieutenant Commander John C. MacEvitt, N. M. N. Y.
First Lieutenant Alexius McGlannan, U. S. A.
Surgeon W. P. McIntosh, U. S. P. H. S.
Major Donald Macrae, Jr., N. G. Iowa.
Major John L. Macumber, N. G. N. Y.
Captain J. Charles Madara, N. G. Md.
A. A. Surgeon W. H. Marsh, U. S. P. H. S.
Major William Marshall, Jr., N. G. Del.
Captain A. A. Marsteller, N. G. Va.
Major E. L. Martindale, N. G. Iowa.
Colonel L. Mervin Maus, U. S. A.
First Lieutenant H. A. Mitchell, N. G. Md.
Major Walter C. Montgomery, N. G. N. Y.
First Lieutenant W. P. Morrill, U. S. A.
Major Edward S. Moulton, N. G. Conn.
Major E. L. Munson, U. S. A.
Medical Director F. S. Nash, U. S. N.
Captain J. B. Nelson, N. G. Ariz.
Captain George H. Palmerlee, N. G. Mich.
Major Carl Phillips, N. G. Kans.
Medical Inspector George Pickrell, U. S. N.
Captain William O'G. Quinby, N. G. N. J.
Lieutenant Colonel L. H. Reichelderfer, N. G. D. C.
Major Buell S. Rogers, N. G. Ill.
Assistant Surgeon General W. C. Rucker, U. S. P. H. S.
P. A. Surgeon Thomas W. Salmon, U. S. P. H. S.
Major M. I. Samuel, N. G. Del.
First Lieutenant Karl Schaffle, N. G. Pa.
Lieutenant Colonel William Gray Schauffler, N. G. N. J.
First Lieutenant Louis H. Schultz, N. G. Colo.
Major Gilbert E. Seamon, N. G. Wis.
Asst. Surgeon Robert F. Sheehan, U. S. N.
First Lieutenant Richard Slee, U. S. A.
Major H. H. Snively, N. G. Ohio.

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Major Samuel C. Stanton, N. G. Ill.
Lieutenant Colonel Andrew S. Stayer, N. G. Pa.
Medical Inspector J. M. Steele, U. S. N., retired.
Surgeon General C. F. Stokes, U. S. N.
Major G. Lane Taneyhill, N. G. Md., retired.
Major William S. Terriberry, N. G. N. Y.
Doctor W. T. Thackeray, U. S. A.
First Lieutenant W. S. Thayer, U. S. A.
Captain Henry D. Thomason, U. S. A.
Chief Surgeon Joseph H. Townsend, N. G. Conn.
A. A. Surgeon William G. Townsend, U. S. N.
Captain Robert F. Trainer, N. G. Pa.
P. A. Surgeon G. B. Trible, U. S. N.
Captain J. Harry Ullrich, N. G. Md.
Major G. M. VanPoole, U. S. A.
Major Charles B. Walls, N. G. Ill.
Colonel J. K. Weaver, N. G. Pa.
Captain Samuel T. Weirick, U. S. A., retired.
First Lieutenant Arch. M. Wilkins, U. S. A.
Captain Allie W. Williams, U. S. A.
Major Frank P. Williams, N. G. Mass.
First Lieutenant L. P. Williamson, U. S. A.
Captain Dale Wilson, N. G. Ohio.
Lieutenant Colonel M. C. Wyeth, U. S. A., retired.
Major C. S. Young, N. G. Ill.
Surgeon G. B. Young, U. S. P. H. S.

REPRESENTATIVES OF FOREIGN NATIONS.

Lieutenant Colonel George S. Rennie, Canadian Army Medical Corps.
Major E. J. Williams, Canadian Army Medical Corps.
Captain James H. McGarry, A. M. C., Canada.
Colonel H. C. Chang, Chinese Army.
Major S. H. Chang, Chinese Navy.
Captain M. Y. Tong, Chinese Navy.
Captain S. F. Hsii, Chinese Navy.
Surgeon General A. Bornemann, Royal Navy, Denmark.

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M. le Médecin Inspecteur Général Ch. Fevrier, French Army.
M. le Médecin en Chef de 2e Classe Barthelemy, French Army.
M. le Médecin Principal de 2e Classe Rouget, French Army.
Lieutenant Colonel S. Hickson, M. B., Royal Army Medical Corps.
Colonel R. Bengoechea, Guatemala.
Colonel Surgeon Chevalier Francisco Testi, Italian Royal Navy.
Major Carlo Maurizio Belli, Italian Royal Navy.
Surgeon M. Serrati, Italian Navy.
Colonel Eduardo R. Garcia, Mexico.
Surgeon General A. A. Zohrt, Baltic Squadron, Imperial Russian Navy.

Tuesday, October 1, 1912.

9:30 O'CLOCK A. M.

BUSINESS SESSION.

(FOR MEMBERS OF THE ASSOCIATION ONLY.)

The Annual Business Meeting of the Association of Military Surgeons was called to order at the Belvedere Hotel by the President.

Surgeon Charles P. Wertenbaker, U. S. P. H. S., President: "We will now have the report of the Executive Council."

Major Charles Lynch, U. S. A., Secretary: "Two meetings of the Executive Council have been held during the year, one immediately after the annual meeting in Milwaukee and one last evening. The first meeting was called to order by the President at Milwaukee last year. (Reading of minutes.) The second meeting of the Council was held here last evening at 8:30. Those present on this occasion were Surgeon Wertenbaker, President; Surgeon Braisted, Lieutenant Colonel Kean, Lieutenant Colonel Schauffler, Major Arnold, Treasurer, and Major Lynch, Secretary. There were a number of names proposed for membership at this meeting and elected. They are as follows:

ACTIVE.

1st Lieut. Harvey S. Albertson, N. G. N. Y.
P. A. Surgeon R. W. McDowell, U. S. N.
1st Lieut. A. J. Hoskins, M. R. C.
1st Lieut. G. H. Raithel, M. R. C.

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1st Lieut. M. S. Lombard, M. R. C.
1st Lieut. Virgil Loeb, M. R. C.
Maj. W. F. Truby, U. S. A.
1st Lieut. F. LeSirelle Reder, M. R. C.
1st Lieut. E. D. Hurley, Mass. N. G.
Maj. C. D. Gamble, Ohio N. G.
Capt. Wm. T. Davis, U. S. A.
1st Lieut. R. W. Matson, M. R. C.
1st Lieut. A. H. Sewing, M. R. C.
1st Lieut. C. C. Rogers, M. R. C.
1st Lieut. Homer Rogers, Cal. N. G.
Maj. E. R. Whitmore, U. S. A.
Capt. Wm. H. Richardson, U. S. A.
1st Lieut. F. A. King, Mass. N. G.
1st Lieut. Armin Mueller, U. S. A.
1st Lieut. C. J. Gremillion, M. R. C.
1st Lieut. T. J. O'Malley, M. R. C.
1st Lieut. Wm. B. De Garmo, M. R. C.
1st Lieut. Geo. F. Wilklow, M. R. C.
Capt. R. S. McCaughey, Ill. N. G.
1st Lieut. F. C. Griffis, M. R. C.
Capt. Otto G. Wiedman, Conn. N. G.
1st Lieut. John O. Rush, M. R. C.
1st Lieut. E. B. Gleason, M. R. C.
1st Lieut. Edward Quintard, M. R. C.
1st Lieut. Chas. E. Donlan, M. R. C.
1st Lieut. E. C. Henry, M. R. C.
1st Lieut. E. H. Pool, M. R. C.
1st Lieut. Cuthbert Powell, M. R. C.
1st Lieut. John S. Nagel, M. R. C. & Ill. N. G.
1st Lieut. H. F. Philips, M. R. C.
1st Lieut. S. Meredith Strong, M. R. C.
1st Lieut. S. T. Millard, M. R. C.
1st Lieut. Willy Meyer, M. R. C.
1st Lieut. William Hessert, M. R. C.
1st Lieut. Geo. C. Beach, Jr., M. R. C.
1st Lieut. F. St. Clair Reilly, M. R. C.
1st Lieut. I. J. Ransbottom, M. R. C.

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1st Lieut. J. E. Bastion, U. S. A.
1st Lieut. H. W. Taylor, M. R. C.
Capt. A. E. Lane, Wyo. N. G. & M. R. C.
1st Lieut. R. L. Tebbitt, M. R. C.
1st Lieut. T. F. Goulding, M. R. C.
1st Lieut. Stanley Stillman, M. R. C.
1st Lieut. F. W. Shaw, M. R. C.
1st. Lieut. Wm. L. Gist, M. R. C.
1st Lieut. F. B. Turck, M. R. C.
1st Lieut. E. W. Peterson, M. R. C.
1st Lieut. W. E. Musgrave, U. S. A.
1st Lieut. H. Sheridan Baketel, M. R. C.
Asst. Surgeon R. F. Sheehan, Jr., U. S. N.
1st Lieut. Wm. H. Lloyd, M. R. C.
1st Lieut. J. W. Colbert, M. R. C.
1st Lieut. A. P. Condon, M. R. C.
1st Lieut. R. T. Legge, M. R. C.
1st Lieut. A. E. Rockey, M. R. C.
1st Lieut. James F. Breakey, M. R. C.
1st Lieut. E. E. Roberts, M. R. C.
1st Lieut. George Newlove, M. R. C.
Capt. R. H. Newman, Tenn. N. G.
1st Lieut. C. F. Smith, M. R. C.
1st Lieut. O. G. Pfaff, M. R. C.
P. A. Surgeon H. W. Cole, U. S. N.
1st Lieut. Clarence Martin, M. R. C.
Capt. H. W. Meyerding, Minn. N. G.
Maj. Wm. G. Townsend, Md. N. G.
Capt. B. McPherson Linnell, N. G. Ill.
Maj. Fred A. Pittenger, N. G. Idaho.
Maj. Frank P. Williams, N. G. Mass.
Maj. Charles S. Young, N. G. Ill.
1st Lieut. Louis Huber Schultz, N. G. Colo.
Maj. Geo. P. Lingenfelter, N. G. Colo.
Maj. Walter C. Montgomery, N. G. N. Y.
1st Lieut. Howard A. Grube, N. G. Mich.
Capt. Julius B. Nelson, N. G. Ariz.
Maj. H. Vance Clymer, N. G. Ariz.

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Maj. Carl Phillips, N. G. Kans.
Lieutenant Colonel Edwin M. Fuller, N. G. Maine.
Maj. Clarence F. Kendall, N. G. Maine.
1st Lieut. Karl Schaffle, N. G. Pa.
Capt. Dale Wilson, N. G. Ohio.
Capt. Robert F. Trainer, N. G. Pa.
Capt. H. H. Doan, N. G. Pa.
Capt. J. Charles Madara, N. G. Md.

ASSOCIATE.

Lieut. Col. W. Ramsay Smith, P. M. O., Fourth Military District. Commonwealth Military Forces, Australia.

"Further than this the discussions of the Executive Council last night had to do with the financial affairs of the Association and recommendation was made by the Council that the President be empowered in appointing the auditing committee to also delegate to that committee authority to make a careful study of the financial condition of the Association. This committee will be appointed in due course by the President of the Association and will not be required to report until the end of the meeting."

In reply to an inquiry regarding dues and subscriptions the Secretary answered as follows: "The annual assessment is $4.00 and includes the dues and subscription to the journal. That subject was discussed at the last annual meeting. The Post Office Department had required us to separate dues and subscription, and it was so printed in the Constitution and By-Laws. At that time it was recommended to the Association by the Executive Council and approved by the Association that $4.00 should be the amount which members would be required to pay annually."

A motion to the effect that the report be accepted as read was carried.

President: "The next order of business is the report of the Treasurer."

Major H. A. Arnold, N. G. Pa., Treasurer: "I wish to invite attention to the fact that remittances from advertisements arrived after the Treasurer's books were in the hands of the accountant, and it was impossible to enter them in this year's report. However, they are counterbalanced by expenses not due until the first

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of the month. Those expenses are practically the same amount or slightly less than the remittances. Approximately the amount of money in the hands of the Treasurer at this time represents the correct balance.

REPORT OF THE TREASURER.

H. A. ARNOLD, TREASURER, in Account with the Association of Military Surgeons of the United States.

Report of Receipts and Expenditures from September 22, 1911, to September 28, 1912.

Receipts.

Balance on hand Sept. 22, 1911		$5,033.68	
Received from application fees		422.00	
Received from dues		4,048.28	
Received from sale of insignia		134.00	
Received from the MILITARY SURGEON:			
For Subscriptions	$1,409.57		
For advertising	854.76		
For reprints	381.75		
		2,646.08	
Received from Interest on deposits		131.15	
Received from miscellaneous source		1.20	
			$12,416.39

Disbursements.

Rent, Secretary's office	$420.00
Telephone	57.00
Secretary's salary	1,200.00
Clerks' salaries	1,200.00
Secretary's office expenses	276.25
Secretary's expenses, 1911 meeting	194.20
Treasurer's expenses, 1911 meeting	109.50
Treasurer's compensation	300.00
Telegrams and expressage	2.25
Postage, Treasurer's office	121.55
Audit of 1911 report	12.50
Printing and mailing THE MILITARY SURGEON	4,497.96
Commissions paid on ads. in THE MILITARY SURGEON	90.00
Binding copies of THE MILITARY SURGEON	3.25
Army List and Directory	1.50
American Medical Association Directory	6.00
Purchase of insignia	237.50
Prize essay, Edw. B. Vedder	200.00

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Printing and stationery		57.39	
Treasurer's bond		15.00	
Safe deposit box		3.00	
			$9,004.85
Balance in Treasurer's hands Sept. 28, 1912			$3,411.54
Sept. 22, 1911, badges on hand	11		
Badges bought	25	36	
Badges presented	7		
Badges sold	9	16	
Sept. 28, 1912, badges on hand		20	value, $200.00
Sept. 22, 1911, buttons on hand	15		
Buttons bought	25	40	
Buttons sold		22	
Sept. 28, 1912, buttons on hand		18	value, $36.00

ARDMORE, PA., Sept. 28th, 1912.

This is to certify that I have examined the books and accounts of Major H. A. Arnold, Treasurer of the Association of Military Surgeons of the United States, for the year ending September 28th, 1912, and find the same to be correct, and that there is a balance in his hands at this date of $3,411.54, as per report submitted herewith.

FRANKLIN SMITH,
Public Accountant and Auditor.

Affirmed and subscribed before me, a Notary Public for the Commonwealth of Pennsylvania, residing in Montgomery County, this 28th day of September, A. D. 1912.

LOUISE H. KAIN,
Notary Public.

(Commission expires Feb. 21, 1915.)

[Seal.]

The Treasurer also stated:

"The interest period comes due on September 30th and this audit was made September 28th."

A certified check payable to the Association for the balance on hand was exhibited by the Treasurer.

President: "You have heard the report of the Treasurer. What is your pleasure?"

Lieut. Col. Kean: "From the Treasurer's report we find that we are running behind about $1,700.00. Our expenses are exceed-

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ing our income to that extent. It was suggested at the Executive Council last night that the auditing committee to be appointed today should at the same time take into consideration the question of how to reduce the expenditures and bring them within our income. It is thought wise that the matter be thoroughly discussed here before any action is taken. I would like to ask how much is due the Association from members?"

Treasurer: "This memorandum will give you those figures. There are 278 members of the Association owing $4.00, one year's dues; there are 85 owing $7.50, two years' dues. I have 38 who owe $11.00, with whom I am keeping in touch. It is worth while because once in a while amounts of that character are paid. On July 1st there were 43. This shows that five have paid since July 1st. One hundred and ten owed $7.50, and there are only 85 now. There are 883 fully paid, without counting life members, and 8 have paid 1913 dues. These figures are approximately accurate."

Colonel Joseph K. Weaver, N. G. Pa.: "It would seem that in spite of the fact that we have $1,500 due us in unpaid dues, we are still running behind our income."

Colonel John Van R. Hoff, U. S. A.: "Those of you who were members of the Association at the time we made the change from publishing the proceedings in an annual volume to the magazine will realize that the proceedings were always gotten up by a committee duly appointed which acted without reward. It so happened that I was President of the Association at the time when the magazine was determined upon. It was not my intention, however, that the magazine should cost us any more than the proceedings, nor that the Secretary and his office should be paid. General Adams consented to give up the secretaryship and Major Pilcher was elected Secretary, with the understanding that he and I should begin the publication of the journal. It was definitely understood at the time of his appointment that he was not to receive any remuneration. My idea was that it was our duty as a military organization to make our dues so low that everybody would join and could join. The dues, in the beginning, twenty-one years ago, were $2.00 annually. They were raised to $5.00, reduced to $3.00, and increased to $4.00. At that time, although

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the Association was in a serious condition, as is well known by some of the older members, we had possibly $4,000.00 in the treasury. That was eleven years ago. We seem to be a $1,000.00 worse off now. Our journal is costing us so much that our income does not meet it. I am glad to hear that the Executive Council has recommended that the committee to be appointed to audit the Treasurer's accounts will be requested to make a report on the financial condition of the Association."

Major W. S. Conkling, N. G. Iowa: "I would like to have the figures for 1911. How were we going then?"

Treasurer: "In 1911 the balance on hand was $5,033.68. This amount has been reduced to $3,411.54."

Secretary: "I might explain the difference in the income is partly due to the fact that last year our account for printing was for only eleven months, while this year it is for thirteen months."

Major Conkling: "What does the journal cost?"

Major Lynch: "We have always tried to keep it at about $300 monthly. We were printing 2,300 copies, but subscription from the War College was withdrawn with the new fiscal year."

Lieut. Col. Kean: "I think that it is not really so bad as the showing from the treasurer's books would indicate, as the Association has a much improved journal. Of course the practice of spending more than we take in is bad policy. I think the time has come to put the affairs of the Association on a good business footing. It seems to me that the first step towards this is to settle the question of delinquent members. This is a serious question. It appears we have 123 members delinquent, not since the first of January of this year but for two years and three years. I would like to point out that this is contrary to Section 2 of Article IV. I think, therefore, that steps should be taken to stop this continued delinquency. I will propose an amendment which I think will relieve the situation as far as delinquent members are concerned. I would also point out that the Post Office Department forbids carrying delinquent members more than six months. I think we should carry this out."

Major Munson: "It looks like a lack of interest to me. How many have resigned?"

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Treasurer: "As to the number of resignations, I cannot give it without going over my books. Some resignations do not take effect until the end of the year. Every member receives a statement on the first of each year; on the first of July he receives a second notice urging payment, and when he is indebted for two years' dues he receives a printed notice calling attention to Section 2, Article IV. The correspondence is very large. It lasts through the entire year. Points are raised by members. Some are sure they have paid their dues,.yet they have no receipts. Some time must elapse before the matter can be straightened out."

Major Munson: "What is the membership at the present time, compared with last year?"

Secretary: "I have the list of the membership to date, but I cannot tell you the membership of a year ago. This list is always made out to determine the number of votes each service has on the nominating committee. The number of members according to my records is: Army, 580; Navy, 191; Public Health Service, 124; Organized Militia, 507—total, 1,402. The number includes active and life members."

President: "Is there any further discussion?"

A Member: "Can the matter come up for discussion at the time of the report of the auditing committee?"

President: "Yes."

President: "If there is no further discussion at this time I will state that the names of the auditing committee will be announced before the close of the morning session."

President: "The next report is that of the Secretary-Editor."

REPORT OF THE SECRETARY AND EDITOR.

The work of this office has been carried on in the usual manner during the year. Naturally, the principal part of this work is concentrated on the journal published by the Association. The size of this journal, and, in large measure, its appearance, are dependent on the revenue received from various sources. There is no dearth of articles and very good articles at present. More could easily be obtained than we can afford to publish.

Every effort has been made to obtain new members. Eighty-nine have been secured during the year.

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The income from advertisements shows little change. Nor does it appear probable that, unless we change our methods, we can place dependence on a much greater revenue from this source.

The articles published in the journal during the year are thought to have been generally of a high order of merit. It is a pleasure to be able to record the fact that they are generally appreciated abroad by those competent to judge.

One of the duties imposed on the Secretary of the Association for the year was to communicate with the American Medical Association and the state and county medical societies, with a view to promoting local symposia on military hygiene, organization, personnel and supplies. An earnest attempt has been made to accomplish something in this direction, but I regret to say that this has not been crowned with success.

Every county society in the United States, as well as the American Medical Association and the state medical societies, have been communicated with a view to arranging lectures on military medical subjects for them. Very few replies requesting such lectures have been received; that is to say, not more than half a dozen in all. It was found that it was impossible to secure mileage orders for medical officers of the regular establishment to deliver lectures of the character contemplated. In a very few instances such officers were able to give lectures at points not involving travel from the posts at which they were stationed. In only one or two instances medical officers of the organized militia have been able to give the lectures. It is apparent, therefore, that very little can be accomplished unless the various medical societies can be induced to manifest greater interest in the lectures in question. Then the further difficulty arises of how we are to furnish lecturers. As will be seen from what has been said above, there is no possibility of obtaining lecturers from the medical officers of the regular establishment except in isolated instances. A very similar condition prevails with medical officers of the organized militia.

If the chief surgeons of the various states can find time in the midst of their other arduous duties to work up interest in this subject in their states, this is thought to be the best method which could be adopted. So far as lecturers are concerned, it is believed

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that these would have to come largely from the officers of the local organized militia, though doubtless, in a few places, when giving the lectures did not involve travel, medical officers of the regular establishment would be glad to play their part in what we all realize is a very important work. From the experience gained, it is thought to be almost a waste of time for the Secretary of the Association to attempt to follow the plan outlined for this year.

I want to take this occasion to thank the many members of the Association who have assisted me during the year.

President: "You have heard the report of the Secretary and Editor. What is your pleasure?"

Report accepted.

President: "The next report is that of the Literary Committee."

Secretary: "While the Literary Committee has made no report, perhaps Major Conkling, a member of that committee, will report for them."

Major Conkling stated that he had met with difficulty in securing assistance and that one member of the committee had never been heard from, although he had been appealed to on several occasions. He said further: "I secured eight papers from the states to which I was assigned. I wish to thank those who did render assistance. I don't think we were notified in time. I got a letter from Major Lynch, and I learned from that that I was on the Literary Committee. Perhaps I should have read the journal. I think the program should prove interesting. Militia officers, as a rule, are busy men and need lots of time to prepare papers."

President: "As everybody knows, the work of the Literary Committee is most difficult. The plan this year seems to have brought better results, however. It starts a good many more people to work on the subject. I think it a very good plan. You have heard the report of the committee. What is your pleasure?"

Major Stanton: "I would like to make a suggestion. I found it very successful in my state. That is to pick out certain men and tell them they are down for a paper—not ask them for it."

Major Conkling: "I will state that I informed the chief sur-

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geons that one or two papers would be expected of their states. I could not order them."

President: "What is your pleasure, gentlemen?"

Report accepted.

President: "The next order of business is the appointment of special committees for the meeting."

President: "It was thought well to appoint a special committee on resolutions, to which resolutions should be referred when presented to the Association. Frequently a resolution is presented and there is no time to consider it, consequently, action is hasty or no action is taken. I will ask Colonel Schauffler, Captain Thomason, Surgeon Spratling, Acting Assistant Surgeon Marsh and Colonel Stayer to serve on this committee."

Colonel Hoff: "It should be clearly understood before the committee is appointed just what the procedure is to be. If resolutions are simply to be considered by the committee and their recommendation is then open to debate, possibly the committee will do well. I think it should be distinctly understood whether or not a report of the committee will be open to discussion."

President: "I think the idea in regard to this committee was that they consider all resolutions which are referred to them and they report back to the Association their recommendation, and that the resolutions then be open for debate. I will be very glad to have an expression of opinion from the Association on the subject."

Major Taneyhill: "We expedite business in just that way in the American Medical Association. It is merely to save long debate."

The following motion was then made by Major Taneyhill: "I move you, sir, that a Resolutions Committee be appointed to consist of five members to be appointed by the President, to which shall be referred all resolutions which are introduced into this body, this committee to report upon these resolutions and their report to be open to debate."

Motion carried.

President: "The committee as originally named will stand."

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President: "The next report is that of the Committee on Legislation."

REPORT OF COMMITTEE ON LEGISLATION.

"Having been appointed Chairman of your Committee on Legislation, at the Milwaukee Meeting, I have the honor to present its report:

"As this Committee was composed entirely of National Guard officers, it was hoped that the results desired by the Association would be accomplished, for, as National Guard officers, they should have been able to criticise and suggest changes in National laws, this privilege being denied to officers of the regular service. Therefore, the Committee submits its report, dissatisfied with itself, and feeling regret and disappointment as the results of its labor.

"The year has been valuable as a school of instruction, and believing that the experience of the past has shown how best to proceed toward the accomplishment of the desired results, your Chairman respectfully suggests that the Committee be continued. With this view of the situation in legislative matters before us, the Committee reports progress, and appends correspondence showing its work in detail."

[(Unfortunately, on account of lack of space, it is impossible to print this very valuable report in its entirety; extracts are therefore given.)—EDITOR.]

The first communication received was from Doctor C. A. Warwick, of South Bend, Ind., and referred to contract surgeons. Resolutions on this subject were adopted by this Association, and were brought to the attention of individual Senators and Congressmen. The following letters show the interest and activity of the Chairman of the Committee in organizing his committee and in bringing to the attention of members all matters which had been referred to said committee The special attention of the Committee was invited to Senate Bill No. 2117, An Act to Promote the Efficiency of the Public Health and Marine-Hospital Service. This important bill was finally approved and became law. The Committee on Legislation is certainly to be congratulated on having contributed to this result.

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Letters in respect to other legislation desired by the Association were addressed to certain Senators and Congressmen by the Chairman and some other members of the Committee. The subject of state legislation was taken up in New Jersey by the introduction of a bill entitled "An Act Concerning Honorably Discharged Surgeons," which provided for the registration of such physicians in that state without examination. A letter on the same subject was subsequently addressed to each member of the Board of Medical Examiners. An amendment to the bill was suggested by the President of the Association, and each member of the assembly was addressed in its interest. The bill was subsequently returned from the Committee on Public Health to the House of Assembly, where it was amended to include the Public Health Service.

The Chairman of the Committee then says: "The bill as amended was again referred to the Committee on Public Health, when its introducer, Mr. Branigan, was taken ill, and no action was taken on it in Committee.

"I have the assurance that every effort will be made to enact it into law during the next session of the New Jersey Legislature.

"I have been informed that a provision covering this bill already exists in my state.

"In conclusion, your Chairman believes:

"1. That the merits of these measures entitle them to enactment into law, notwithstanding the pledge of retrenchment encountered in Congress.

"2. That it is possible for the National Guard membership of this organization to achieve this result.

"3. That the enthusiasm displayed at our meetings is nil, when not supplemented by zealous personal work with legislators at home.

"4. That the Chairman of the Legislative Committee cannot secure the coveted result, unaided by the active co-operation of each Committee member.

"5. That success in Legislative matters requires active inter-co-operation by the Committee and persistent 'hammering' of legislators by the Association's membership.

"The Chairman's thanks are herewith tendered to President

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Wertenbaker and others for their kind assistance during the year.

"Respectfully submitted,--

"(Sgn.) HENRY ALLERS,
"Lieut. Colonel, Med. Corps, N. G. N. J.,
Chairman, Committee on Legislation."

President: "You have heard the report of the Committee on Legislation. What is your pleasure?"

Report accepted.

President: "I will now ask the Chairman of the Committee on Arrangements to report for his Committee."

The report of this committee, made by Captain Ullrich, Chairman, consisted of announcements regarding the social functions for the week.

A motion for the acceptance of the report was carried.

President: "The next report is the report of the Publication Committee."

Major Lynch: "The personnel of this committee is as follows: The Secretary of the Association is chairman and Surgeon Kennedy, Assistant Surgeon General Trask and Major Foster are the other members. One meeting of the committee has been held during the year, at which three members were present. At this meeting the subject of the literary and financial conduct of the journal was discussed, and the chairman of the committee explained to the other members what was being done in these two particulars. The committee directed the chairman to proceed on the same lines, making some suggestions with a view to securing more advertisements. This was done, though with very meagre results."

Surgeon William C. Braisted, U. S. N., First Vice President, Presiding: "You have heard the report of this committee. What is your pleasure in regard to it?"

Report adopted.

Chairman: "The next item is the report of the Necrology Committee."

REPORT OF THE COMMITTEE ON NECROLOGY.

"The Committee on Necrology has the honor to report that since the last meeting of the Association, the deaths of ten mem-

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bers have been reported. Of these, the Medical Corps of the Army lost one, the Medical Reserve Corps of the Army, three, the Navy two, the Public Health Service four, and the National Guard four.

"The Chairman of the Committee desires to acknowledge his indebtedness to the members of the Committee from the various services for their courtesy and painstaking care in securing data for the biographical notices of the deceased members.

"In chronological order the deaths since the last meeting are as follows:

Lieutenant Carl Beck, M. R. C., U. S. Army, an active member of the Association; died at his summer home, Pelham Heights, N. Y., June 8, 1911, from pneumonia, aged 55.

Lieutenant Frank Pierce Foster, M. R. C., U. S. Army; an active member of the Association; died in Chadwick, N. J., August 13, 1911, from cancer of the throat, aged 69.

Surgeon Eugene Wasdin, U. S. P. H. Service; an active member of the Association; died in Philadelphia, November 17, 1911, after nervous disease of long standing, aged 53.

Passed Assistant Surgeon Ransom Edwards Riggs, U. S. Navy; an active member of the Association; died on board the U. S. S. Ohio, in Hampton Roads, Va., November 18, 1911, from acute hemorrhagic pancreatitis, aged 39.

Surgeon General Walter Wyman, U. S. P. H. Service; an active member and president of the Association in 1905; died in the Providence Hospital, Washington, D. C., November 21, from diabetes mellitus, aged 63.

Major Morris Franklin Cawley, M. C., N. G. Pa.; an active member of the Association; died at his home in Allentown, January 6, from cerebral hemorrhage, aged 54.

Colonel Norton Royce Hotchkiss, formerly Surgeon General of Connecticut; an active member of the Association; died at his home in New Haven, January 29, from leukemia, aged 41.

Acting Assistant Surgeon Robert Catlett White, U. S. P. H. Service; an active member of the Association; died at his home in Pensacola, Fla., February 14, from complications resulting from influenza, aged 80.

Rear Admiral George Edwin Hurst Harmon, Medical Director, U. S. Navy; an active member of the Association; died at the home of relatives in Cambridge, Md., March 5, aged 64.

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Lieutenant Henry O. Walker, Medical Reserve Corps, U. S. Army; an active member of the Association; died at his home in Detroit, April 5, from pneumonia, aged 68.

Colonel Louis W. Crampton, Medical Corps, U. S. Army; an active member of the Association; died at the Stewart Hotel, San Bernardino, Cal., April 12, from pneumonia, aged 63.

Passed Assistant Surgeon Thomas Brown McClintic, U. S. P. H. Service; an active member of the Association; died in Washington, August 13, from Rocky Mountain spotted fever, aged 39.

Lieutenant Colonel William James Parker, N. G., N. J.; an active member of the Association; died at the home of his mother in Jersey City, N. J., August 25, from typhoid fever, aged 54.

"(Sgn.) S. C. STANTON,
"Chairman."

General Girard: "I move that the report be received by the members standing and in silence."

The report was so accepted.

Assistant Surgeon General W. C. Rucker:

MR. PRESIDENT: During the past year two names have been stricken from the roster of the United States Public Health Service, and in each instance a faithful servant of the nation and an earnest laborer for the nation's weal has fallen with the harness still upon him. The one was a man whose life had been filled with many accomplishments and whose name had been written high upon the list of those who love their fellow men. The other was a young man at the zenith of his career, one who had already done much for the advancement of the science of preventive medicine and whose future was full of promise. Each was a man of many friends, and each is mourned today by this Association. Both were my friends. The one stood, so to speak, *in loco parentis* to me; the other was as dear to me as a blood brother, for we have slept in the same bed, eaten from the same dish, and shared our joys and sorrows together. The one was

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Surgeon General Walter Wyman; the other was Passed Assistant Surgeon T. B. McClintic. It is not my purpose to review in detail the lives and accomplishments of these two men, whose going forth has meant so much to all of us, particularly those of us who have been closely associated with them and learned to love them, but I hope that you will bear with me for a moment while I point out a few of the characteristics of the two men. Walter Wyman was a strong men. A long line of stern, unflinching, unafraid New England ancestors gave to him the courage and determination to take a small service, just emerging from an obscurity dating back to Colonial days, and to make of it the cornerstone of the public-health structure of the nation.

Partaking of this sternness and fearlessness, he was at the same time tempered by that broadmindedness, charity, and kindness which has endeared him to this Association of which he was once president and in whose welfare he always manifested the deepest interest. Note, now, the parallelism of ancestry between the two men of whom I am speaking. Dr. McClintic was the offspring of a Scottish clan transplanted to the blue hills of Virginia. To go among them and see their sterling, upright honesty and to realize their loyal hospitality is to understand, indeed, the character of Dr. McClintic.

Dr. Wyman was educated in his father's school. Dr. McClintic was educated in his father's home. Dr. Wyman intended to become a lawyer, but he one day strayed into a lecture hall of a St. Louis medical college, and from that moment his determination to become a doctor was fixed. Dr. McClintic expected to become a farmer, but, working in his uncle's store one day, he was fired with the idea of getting out in the great world which lay beyond the mountains and becoming a healer of sick bodies. Note how the parallelism continues. Both entered the service in early manhood, and both gave all of their adult life to it; both served their nation both ashore and afloat, at home and abroad; the one died long before his time, his death undoubtedly hastened by the arduous labor and continued battle to which he was exposed. The other, seeking to eradicate a disease which threatened the lives and commercial prosperity of a goodly section of the west, himself fell a victim to the disease.

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I do not think that we need dwell in detail on the life accomplishments of Surgeon General Walter Wyman. Most of us knew him well personally, and all of you are familiar with his labors and his accomplishments. Suffice it to say that he has built up a great and a strong service and has left behind him a monument more enduring than marble or bronze.

I wish that I had the power to make you know and appreciate the bigness and the kindness of Dr. McClintic. "Tommy" we called him in the corps, and the Lord never made a better man. It was my good fortune to be associated with him in his first expedition for the purpose of studying the methods of the control and eradication of Rocky Mountain spotted fever. Picture in your mind's eye a great valley, one side of which basks in the smile of prosperity, the other side overclouded and blackened by the dark cloud of disease. Dr. McClintic went into this valley and established his headquarters in the midst of the infected district. He experimented with all the native mammals in the hope of discovering the mammalian host of the disease, and his researches, which are as yet unpublished, point indubitably to the fact that both the Rocky Mountain goat and the Columbian ground squirrel play a role in the incidence and perpetuation of the disease.

He also experimented with ticks, and he took an area in the worst infected district, and in it he destroyed all the ground squirrels and ticks. As a result of his work the findings of the immortal Ricketts have been sustained, the methods for the control of the disease have been placed upon a solid foundation, and the means of ridding ourselves of this disease, which is truly an American disease, have been placed in our hands. This year not a single human case occurred in the area which Dr. McClintic cleaned, and as by some irony of fate Dr. McClintic's was the only case to occur in the Bitter Root Valley this year.

He died bravely. His one thought in the long journey across the continent was that of greeting his young wife and of meeting again his brother officers. One of the last things he said before a beneficent Creator drew the veil of oblivion over his mind was, "I hope the spots wont be gone before the fellows in Washington see them." And so he died, died of injuries received on the

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firing line against that arch enemy of man—disease. May his example be an inspiration to us, and when the silent messenger calls to us from the beyond and our turn has come to sink beneath the waters of Lethe may ours be the courage and the fortitude to answer the call as bravely and as fearlessly as did "Tommy."

Surgeon G. B. Young, P. H. S., also said a few words in respect to Passed Assistant Surgeon McClintic's lovable character.

Major Lynch: "I do not think that we, of the Army, should let this occasion pass without a few words of tribute to Colonel Crampton as a man and as an officer. Colonel Crampton was well known to all of us as a man of the most modest and retiring disposition, but also as one whose advice and assistance were of the greatest value. He was frequently appealed to by young medical officers, and the advice he gave them was always to the point and distinguished by hard common sense. It is doubtful if any medical officer in the service was more popular than Colonel Crampton in his own Corps, and news of his unexpected death was received with the deepest sense of personal loss by many of his fellow medical officers."

Colonel Weaver: "I have been greatly impressed with the remarks that have been made. Perhaps the same thing could be said of the National Guard officers who have given their lives to this work."

Chairman: "The Secretary has a report of a special committee."

Secretary:

REPORT OF COMMITTEE ON INTERNATIONAL CONFEDERATION OF MILITARY SURGEONS OF THE WORLD.

As chairman of this committee I have the honor to make the following report:

At the Twentieth Annual Meeting of the Association, held in Milwaukee, on Friday, September 29th, 1911, the following resolution was introduced:

> In view of the scientific mission that annually brings together the members of the Association of Military Surgeons

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of the United States in its periodical conferences, the importance of the questions that are brought before it, and the benefits which directly and indirectly accrue to humanity throughout the world, as the results of these meetings, I permit myself to formulate and to offer the following resolution:

RESOLVED: That it is the sense of the Congress of the Military Surgeons, at present in session in Milwaukee, upon the invitation of the Society of Military Surgeons of the United States, that steps should be taken in all countries of the world toward the organization of similar associations of military surgeons in each country, with the object of the ultimate formation of an international confederation of military surgeons of the world.

(Sgn.) ANTONIO AGUDO AVILA,
Regimental Surgeon Captain, Argentine.

After an animated discussion the meeting finally decided to appoint a committee to report on this subject at the next annual meeting. The President of the Association was empowered to appoint this committee to consist of the Secretary and two other members. The President named General Girard and Major Clark as additional members of this committee.

It was not possible for the committee to meet as a whole during the year. Major Clark, however, submitted his opinion at the request of the Chairman of the committee and General Girard and the Chairman of the committee held a meeting on September 20th, 1912, at which time Major Clark's letter was read. The two members of the committee present decided to recommend to the Association that the Secretary correspond with the heads of the medical bureaus in the various countries stating that if an association similar to ours is established in said countries we would be glad to take action with a view to forming an international association. It is also recommended that the Secretary send copies of our constitution and by-laws to the heads of the medical bureaus in question. While this action does not exactly correspond with the suggestions made by the absent member of the committee, Major Clark, it is thought that it does so very nearly.

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Colonel Albert J. Briggs, N. G. N. Y., Presiding: "What do you want done with it?

Motion was then made and adopted that the report be accepted and the Committee continue its work.

President: "The auditing committee will now be appointed. The committee will consist of Colonel Hoff, Colonel Briggs, Colonel Fairchild, Surgeon McCullough and Surgeon Young."

President: "We have a communication which brings a great deal of regret to us and I will ask the Secretary to read it."

To the President of the
Association of Military Surgeons of the United States:

SIR:

I have the honor to proffer my resignation as Secretary of the Association of Military Surgeons, and Editor of the official journal.

I still deeply appreciate the honor which was conferred on me by selection for this important office and I am only too eager to testify to my appreciation of the hearty support which has always been accorded me by members. Without this, performance of the duties of Secretary and Editor would have been impossible for me in addition to very engrossing official duties. The time has now come, however, when it is absolutely impossible for me to find time for my work in connection with the journal. This is the sole reason for resigning from a position which has always proved particularly attractive to me.

I request that my resignation take effect on January 1, 1913, as in justice to the Association, and my successor, I wish to continue in office till I have disposed of matters in connection with the present meeting.

Very respectfully,

(Sgn.) CHARLES LYNCH,
Major, Medical Corps, U. S. Army,
Secretary and Editor.

Washington, D. C.,
Sept. 20, 1912.

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President: "You have heard the letter and doubtless with the same regret that I have. What is your pleasure?"

Colonel Weaver: "I presume there is nothing to do but comply with the wishes of the Secretary. I am sure the Association will deeply regret this action. He has filled this position so long and so acceptably. I move that the resignation be accepted to take effect the first of January."

Motion adopted.

Assistant Surgeon General Rucker: "It seems to me that when a man has served the Association as faithfully as Major Lynch and has accomplished the things he has that the Association should do something in the way of expressing its gratitude for these services. I must confess that I know of no way, I have no ideas about the thing but feel it should be done. I would move you, Sir, that a committee of three be appointed by the Chair to prepare a suitable testimonial expressing the gratitude of the Association for the excellent and faithful services of Major Lynch as Secretary of the Association and Editor of the Journal."

The motion was adopted and the President appointed Assistant Surgeon General Rucker, Colonel Kean and Major Conkling to serve on the committee.

President: "The next business is the appointment of the nominating committee."

The following officers were appointed:

Army—Colonel L. Mervin Maus.
Navy—Surgeon F. E. McCullough.
Public Health Service—Asst. Surgeon General W. C. Rucker.
Arizona—Major H. Vance Clymer.
Colorado—Major George P. Lingenfelter.
District of Columbia—Lieut.-Colonel L. H. Reichelderfer.
Illinois—Major Charles B. Walls.
Indiana—Major Frank B. Humphreys.
Iowa—Lieut.-Colonel D. S. Fairchild.
Maine—Major B. F. Bradbury.
Maryland—Captain J. Harry Ullrich.
Massachusetts—Major Frank P. Williams.
Michigan—Captain W. Earle Chapman.
New Jersey—Lieut.-Colonel Henry Allers.

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New York—Major John L. Macumber.
Ohio—Major H. H. Snively.
Pennsylvania—Lieut.-Colonel A. S. Stayer.
Virginia—Major Israel Brown.
Wisconsin—Major Gilbert E. Seaman.

Lieut.-Colonel J. R. Kean then offered the following amendment to the by-laws: In substitution of the last sentence of Section 2, Article IV. "The Treasurer shall as soon as practicable after July 1st of each year prepare and transmit to the Secretary a list of all members delinquent in the payment of dues with the amount due by each, and the Secretary shall print and furnish to each active and life member a copy of such list before the date set for the annual meeting. All members shown in such list as delinquent for two years shall be dropped from membership unless they discharge in full their indebtedness before the date of that annual meeting."

"This is not an amendment to the Constitution but to the By-Laws and can therefore be acted on at this meeting. I request that this be referred to the committee on resolution."

This was done and the meeting adjourned at 12.30 p. m.

SECOND SESSION
Tuesday, October 2, 1912.

4:00 P. M.

President: "The Association will please come to order. The business of this afternoon is the election of officers. We will now have the report of the Nominating Committee."

Colonel L. Mervin Maus, U. S. A., "The Nominating Committee has selected as President, Surgeon William C. Braisted, U. S. Navy; First Vice President, Brigadier General Charles Adams, Medical Corps, National Guard of Illinois; Second Vice-President, Lieutenant Colonel J. R. Kean, Medical Corps, U. S. Army; Third Vice President, Surgeon General Rupert Blue, U. S. Public Health Service; Secretary-Editor, Major Samuel C. Stanton, Medical Corps, National Guard of Illinois, and Treasurer, Major Herbert A. Arnold, Medical Corps, National Guard of Pennsylvania. The city selected for the next meeting is Denver, Colorado."

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Assistant Surgeon General Rucker: "I would move you, Sir, that the report of the committee be accepted."

Motion carried.

Assistant Surgeon General Rucker: "Mr. President, this Association at its last session appointed a committee to select a suitable testimonial to be presented to Major Lynch in recognition of the splendid services rendered the Association. Your committee has the honor to report that after due consideration of the subject a suitable testimonial to Major Charles Lynch on the acceptance of his resignation as Secretary and Editor of this Association, has concluded to recommend as follows:

"On account of the lack of permanence of engrossed resolutions it seems more fitting that the sentiments of this Association be inscribed on some imperishable material. Therefore it is recommended that the committee be authorized to purchase at the expense of the Association a simple silver platter and to have engraved therein the following: Presented to Major Charles Lynch, Medical Corps, U. S. A., by the Association of Military Surgeons in grateful appreciation of his services as its Secretary. 1909-1912.

"It is suggested that the maximum cost be fixed at $30.00."

Signed { W. C. RUCKER. J. R. KEAN. W. S. CONKLING.

President: "The Association has heard the report of the special committee."

Colonel Maus: "I would like to suggest that we not limit the cost of the platter to $30.00 but to $60.00. I move that the report be accepted with the amendment to make it $60.00."

Colonel Allers: "I don't think we ought to limit it to a platter."

Assistant Surgeon General Rucker: "The committee carefully considered this matter. We want a flat dish, not particularly a platter."

Colonel Allers: "I move that it be amended to read 'A suitable gift.'"

Report accepted with amendments.

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Assistant Surgeon General Rucker: "Will Major Lynch please tell the committee what he wants?"

Major Lynch: "I think that may be left to the committee. I feel that I cannot express to the Association how deeply I appreciate the testimonial."

The following resolution amending the By-Laws introduced by Lieut. Colonel Kean, and referring to the Committee on Resolutions, was then reported by Colonel Schauffler, Chairman of that committee.

This is to amend Section 2, of Article IV. "The Treasurer shall as soon as practicable after July 1st of each year prepare and transmit to the Secretary a list of all members delinquent in the payment of dues with the amount due by each, and the Secretary shall print and furnish to each active and life member a copy of such list before the date set for the annual meeting. All members shown in such list as delinquent for two years shall be dropped from membership unless they discharge in full their indebtedness before the date of that annual meeting." This is in place of the last sentence of said section which reads as follows: "Delinquency for two years shall terminate membership, after due notice by the Treasurer."

Amendment accepted and report adopted.

Lieut.-Colonel Kean: "I move that the Chair appoint a committee to change the button of the Society. We have an international treaty with other nations that prohibits the use of the Red Cross. The Association of Military Surgeons has no right to use it. The American Medical Association has given up their cross on the white ground. My motion is that the Chair appoint a committee to consider this question, and report at the next meeting of the Association."

Referred to the Committee on Resolutions.

Lieut.-Colonel Schauffler: "I move that the Secretary cast a ballot for the nominees as recommended by the Nominating Committee."

Secretary: "The ballot has been cast in favor of the nominees."

The following resolution was then adopted and a copy ordered forwarded to the Faculty of John Hopkins Hospital.

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RESOLVED: That the Association of Military Surgeons, now in its Twenty-first Annual Session, in the city of Baltimore, Md., deeply regrets that its Business Session, scheduled for 9:30 a. m., October 1, 1912, conflicted with the hours arranged by the Faculty of the Johns Hopkins Hospital for a Clinical Session, and that the acceptance of the esteemed invitation was thus rendered impracticable.

The meeting adjourned at 5:00 P. M.

THIRD SESSION

Wednesday, October 2, 1912.

9:30 O'CLOCK A. M.

The morning session was called to order in the ballroom of the Belvedere Hotel by Surgeon W. C. Braisted, U. S. N., First Vice President.

This session was devoted to papers on military hygiene, and the following were presented for consideration.

Does the Moderate Use of Alcohol Reduce Health and Efficiency and Should Such Use be Prohibited Among Officers of the Military and Civil Services? Colonel L. Mervin Maus, Medical Corps, U. S. Army. Read and discussed; will appear in the journal.

The Ill Effects of Smoke on Health and Comfort. Surgeon J. B. Stoner, U. S. Public Health Service. Read by title and ordered printed.

Co-operation Between Federal, Municipal and Naval Authorities in the Prevention of Venereal Diseases. Passed Assistant Surgeon G. B. Trible, U. S. Navy. Reading postponed.

Some Remarks on the Construction and Use of the Kitchen Incinerator. Lieutenant Colonel L. H. Reichelderfer, Medical Corps, N. G. D. C. Read and discussed; will appear in the journal.

Gaseous Disinfection in the Field (Illustrated with original apparatus). Major Edward L. Munson, Medical Corps, U. S. Army. Read and discussed; will appear in the journal.

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How May We Determine the Portability of Water in Temporary Camps, Marches and Maneuvers. Captain Robert S. McCaughey, Medical Corps, N. G. Ill. Read and discussed; will appear in the journal.

At 12:30 a recess was taken till 2:00 p. m.

Continuation of Third Session.

WEDNESDAY, 2:15 P. M.

The meeting was called to order by 1st Vice President Braisted. The reading of papers was continued.

A Portable Screened Kitchen. Major Charles S. Grant, Medical Corps, N. G. Iowa. Read and discussed; will appear in the journal.

The Master Key in Sanitation. Assistant Surgeon General W. C. Rucker, U. S. Public Health Service. Read; will appear in the journal.

Hygiene of the Tropics. Passed Assistant Surgeon F. A. Ashford, U. S. Public Health Service. Read by title and ordered printed.

Co-operation of the Public Health Service and the Navy in Time of War. Surgeon T. W. Richards, U. S. Navy. This paper was read out of its regular order by permission of the meeting. It was discussed and will appear in the journal.

The Influence of Camp Epidemics on the Geographical Expansion, Political History and Military Policy of the United States. Major Edward L. Munson, Medical Corps, U. S. Army. Read and discussed; will appear in the journal.

Syphilis: Especially in Regard to Its Communication by Drinking Cups, Kissing, etc. Surgeon W. P. McIntosh, U. S. Public Health Service. Read and discussed; will appear in the journal.

Venereal Disease in the United States Navy: Prevention and Prophylaxis. Surgeon Robert E. A. Ledbetter, U. S. Navy. Read by title and ordered printed.

The Sanitation of Guayaquil. Passed Assistant Surgeon B. J. Lloyd, U. S. Public Health Service. Read by title and ordered printed.

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Exclusion of the Mentally Unfit from the Military Services. Assistant Surgeon R. F. Sheehan, Jr., U. S. Navy. Read and discussed; will appear in the journal.

At the end of the session Dr. Henry W. Kennard presented an invitation for members of the Association to visit the Rosewood State Training School for Feeble-Minded Children.

Adjournment at 4:30 p. m.

Public Meeting, Wednesday, October 2, 1912.

The meeting was called to order at Albaugh's Theater at 9:00 p. m.

The orchestra began the musical program with a march as the delegates proceeded to the rostrum.

Captain W. D. Gould, Chaplain, 4th Inf., N. G. Md., then pronounced the invocation.

Captain J. Harry Ullrich, Chairman of the Committee on Arrangements, said: "This is the twenty-first annual meeting of the Association of Military Surgeons of the United States. It is composed of surgeons of the Army, Navy, Public Health Service and the Organized Militia. They are doing a great work. I now take much pleasure in introducing the chairman of the evening, Mr. A. L. Goldsborough."

Mr. Goldsborough stated that because Major James H. Preston had been unavoidably detained he had been selected as the chairman of the evening. He said further, "I think the average man and woman of the laity, whenever they hear the word military mentioned, think of death and destruction. When we think of the warfare in connection with the word military it makes us shudder. Then how pleasant it is for us to be associated with those men, the military surgeons, who seek to prevent death and who minister to the wounded. When we are called upon to pay our reverence to the military organization, we should place the crown of glory upon the head of that branch of the service which stays death and which heals." Mr. Goldsborough then introduced Governor Philip Lee Goldsborough.

Governor Goldsborough, after expressing his thanks for the invitation extended him to address the association, said: "I welcome you all to Dixie land, to this great state of Maryland and this

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most charming city of the southland. I am sure that the freedom of this city is yours, and I say to you, gentlemen and ladies, that the fullness of this state is yours and that is saying much. Maryland's hospitality is known among all men as an inheritance, coming from one generation to another. Your profession, gentlemen, is a great profession. It has done so much good for mankind. Other professions have not been able to keep pace with your profession. We lawyers, and I am a modest country lawyer, and sometimes the country lawyers are the best, have not been able to keep pace with you surgeons. The surgeon, the doctor, never gives up. All hail to him. Long may he live. I understand you are to visit Maryland's capitol tomorrow. That land is historic, and I am sure you will be welcome visitors. I will be glad to welcome you to the Executive Mansion. I trust that not long in the future we shall again have the pleasure of welcoming you to Baltimore city."

Mr. Edward L. Quarles, Director of the Greater Baltimore Committee, then delivered an address of welcome on behalf of the commercial organizations.

Representing the medical profession of Baltimore, Doctor Hugh H. Young welcomed the Association. Dr. Young told of the important part Baltimore has played in the development of military medicine and surgery and named several of the eminent scientists who received their education in the medical schools of Baltimore. In paying tribute to military surgeons, he called attention to the lead they had taken in checking the spread of typhoid fever by making the inoculation of the men in the service by antityphoid vaccine obligatory. In this connection he referred to the "unfortunate prevalence of typhoid fever in the counties of Maryland, particularly Baltimore county, and even Baltimore city," and declared that he would like to see the State take a hand to check the spread of the disease.

The next speaker introduced by the Chairman was Surgeon Charles P. Wertenbaker, U. S. Public Health Service, President of the Association. His formal address is published in full in this issue of THE MILITARY SURGEON.

Surgeon Wertenbaker: "It is customary when a foreign government sends a delegate to a meeting of the Association for the

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Association to make him an associate member of the Association of Military Surgeons. We will now proceed with that ceremony. The insignia, or badge, is presented to each delegate."

The foreign delegates who had not already been presented with insignia of the Association at former meetings were then so honored.

President: "It is also customary at this time to present to the audience the foreign delegates and to allow them to make some response."

Major E. J. Williams, Canadian Army Medical Corps: "Words fail me at this time to express my pleasure at being in your presence tonight. I wish to extend to you the greetings of the Canadian Army Medical Corps. I wish there were more than three of us to participate in your splendid meeting. We carefully planned a program and we had been here but a short time when we found our program 'busted.' Since that time we have been in the hands of a very efficient entertainment committee. What has taken us most, we have had the opportunity of visiting your splendid medical institutions. We appreciate it, I assure you. I will return feeling that I can never forget our stay here. I again thank you for your generous hospitality."

Major S. H. Chang, Chinese Navy: "I must first express my hearty thanks for your kindness. It is indeed fortunate that we have the opportunity to meet so many of our professional friends of various nations. China is now only in its infancy in the treatment of the sick of her Army. It seems proper for me to say that we have received much benefit in visiting the diffeent states of this government, its institutions and hospitals. We have also received much benefit from the papers and discussions of this meeting. We must give our best thanks that although there may be hostilities between nations there is never war between the members of the medical departments."

Surgeon General A. Bornemann, Royal Navy, Denmark: "Thank you for the kind invitation extended to Dermark. This is the first time Denmark has been represented, and I am glad that I have the honor to be the first delegate. I thank you very much."

Lieutenant Colonel S. Hickson, M. B., Royal Army Medical Corps, Great Britain: "I merely wish to thank you with the great-

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est sincerity and to express my appreciation of the handsome decoration. I don't consider myself a foreign delegate. I merely think of myself, if it is not presuming too much, as a cousin from over the water. I will say that I am greatly impressed with the magnificence of your institutions and hospitals and the pretty and charming ladies, if I may say so."

Surgeon General A. A. Zohrt, Imperial Russian Navy: "I am greatly pleased to be in the United States, the great country of hospitality. I am honored by the kind invitation of the Association of Military Surgeons of the United States. I am much pleased with the very interesting meetings."

The other foreign delegates, who were presented with insignia, were as follows:

China—Captain S. F. Hsii, Captain M. Y. Tong.

France—M. le Medecin Principal de 2 Classe Rouget, M. le Medecin en Chef de 2 Classe Barthelemy.

Italy—Colonel Surgeon Chevalier Francisco Testi, Major Carlo Maurizio Belli, Surgeon M. Serrati.

Mexico—Colonel Eduardo R. Garcia.

Several of these delegates spoke briefly, expressing their thanks to the Association. A number of these addresses were in foreign languages.

The meeting adjourned at 10:00 p. m.

FOURTH SESSION,
Thursday, October 3, 1912.

9:00 O'CLOCK A. M.

At 9:00 a. m. the meeting was called to order by the President at the Medical and Chirurgical Faculty Hall.

The professional program on organization and administration was then taken up as follows:

Co-operation of the Public Health Service with the Navy in Time of Peace. Surgeon F. E. McCullough, U. S. Navy. Read and discussed; will appear in the journal.

Acting Assistant Surgeon W. H. Marsh, U. S. Public Health Service, then brought to the attention of the Association the serious physical condition of Colonel Leonard B. Almy, N. G.

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Conn., retired, and it was unanimously agreed that the sympathy of the Association should be expressed to Colonel Almy.

The reading of papers was then continued.

Mental Hygiene in the Military Service. Passed Assistant Surgeon Thomas W. Salmon, U. S. Public Health Serice. Read and discussed; will appear in the journal.

Training of Medical Officers of the Organized Militia for Service in the Navy. Surgeon R. M. Kennedy, U. S. Navy. Read by title and ordered printed.

Sanitary Troops in the Organized Militia, 1911 and 1912. Captain Henry D. Thomason, Medical Corps, U. S. Army, Division of Militia Affairs. Read and discussed; will appear in the journal.

Reports of General Instructions and Maneuvers at Mt. Gretna and Gettysburg. Captain Robert F. Trainer, Medical Corps, N. G. Pa.

Captain Trainer stated that he had not prepared a paper but desired to take the opportunity to invite attention to the value to National Guard Medical Officers of the training received at Mount Gretna. The speaker added that he had for many years been an officer of the National Guard, but had really had no conception of his duties till he went to Mt. Gretna last year. The very valuable practical instruction given there was by a medical officer of the regular establishment specially detailed to this duty.

A Plea for More Camps of Instruction, Under Government Supervision, for Officers of the Organized Militia. Captain Henry H. Doan, Medical Corps, N. G. Pa. Read and discussed; will appear in the journal.

Problems of the National Guard Regimental Surgeon in a Maneuver Campaign. Major Carl Phillips, Medical Corps, N. G. Kans. Read; will appear in the journal.

A Tour of Military Duty at Fort Riley and Its Lessons. Captain B. M. Linnell, Medical Corps, N. G. Ill. Read; will appear in the journal.

The Advantages Accruing to the National Guard from Tours of Duty with the Regular Establishment like that at Sparta, Wisconsin, in 1912. Major Charles S. Young, Medical Corps, N. G. Ill. Read; will appear in the journal.

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The Instruction of Medical Officers at the Field Service School for Medical Officers at Fort Leavenworth. Lieutenant Colonel Joseph A. Hall, Medical Corps, N. G. Ohio. Class of 1912. Read by title and ordered printed. Lieutenant Colonel Hall also stated that he had agreed last year with Surgeon Braisted that the Association should be invited to Ohio for next year's meeting. Unfortunately he had not been able to be present in time to present the invitation this year. However, he said, he desired to ask for the 1914 meeting in Ohio.

Co-operation Between Federal, Municipal and Naval Authorities in the Prevention of Venereal Disease. Passed Assistant Surgeon G. B. Trible, U. S. Navy. (Postponed from first day.) Read; will appear in the journal.

Lieut. Colonel Hall then said that he thought it would be the height of folly to permit the occasion to pass without inviting the attention of the medical officers of the Guard who were present to the magnificent course of instruction which was available to them at Fort Leavenworth. From personal experience he could testify how valuable this course is, and he urged them to send in their nominations as early as possible as the quarters were limited and this necessarily limited the number of students.

Major Terriberry, Medical Corps, N. G. N. Y., stated that he had been honored by being selected to take the course in question and he thoroughly agreed with Colonel Hall that it was an extremely valuable one. Nominations must be in by January 1. At Leavenworth much valuable time could have been saved if a preliminary practical course of instruction had been available to prospective students. For this reason he believes the officers selected should be among those who had enjoyed the advantages of a course at Antietam or at one of the other similar camps. At Leavenworth he especially enjoyed association with officers of all branches of the service. From this medical officers are well able to get the ideas of other officers and to see exactly how the medical department fitted into the big game.

Major Bradbury, Medical Corps, N. G. Maine, said that he had been fortunate in having had a preliminary course. Without this he would have been absolutely lost. As a matter of fact, regimental service does not at all fit the National Guard medical officer for the performance of his manifold duties in war. One thing

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that impressed him particularly was in respect to the relation which the officers of the organized militia bore to the regular establishment. They were most distinctly not treated as outsiders, but were taken right in, and when they left they all felt that they were *part and parcel* of the Army. "Anyone who loves his work should certainly go to the Leavenworth School." He thought he knew something of his duties before going there but he was soon convinced to the contrary.

Major E. L. Munson, Medical Corps, U. S. Army, said that we were fortunate in having with us at this meeting an officer who has made special study of the practical training of medical officers and he hoped that he would explain what was being done in this regard in Great Britain.

Lieutenant Colonel S. Hickson, R. A. M. C., at the request of the President, then took the floor and spoke as follows: "The greatest benefit to medical officers at Aldershot comes from association with officers of the combatant branches of the service. Staff rides and staff tours are both conducted. Medical tours are carried on in which the problems are unknown till the medical officers are in the saddle. On these tours an officer of the General Staff is present who is well posted on the duties of the medical department in campaign. Tours are also conducted in which officers from all branches of the service are present. Then each discusses on the ground the work of his own particular branch and criticisms are made."

Camp Sanitation and Joint Maneuver Camps of 1912. Captain Henry D. Thomason, Medical Corps, U. S. Army, Division of Militia Affairs. Read by title and ordered printed.

The Adaptation of the Paper Work of the Organized Militia to That of the Medical Department of the Army. Major George S. Crampton, Medical Corps, N. G. Pa. Read by title and ordered printed.

Adjournment at 12:00 m.

FIFTH SESSION,
Friday October 4, 1912.
9:30 A. M.

At the appointed hour the meeting was called to order by the President at the Medical and Chirurgical Faculty Hall. This day

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was intended to comprise papers on military medicine and military surgery.

The papers read were as follows:

Recent Advances in Sanitation in the Navy. Surgeon A. W. Dunbar, U. S. Navy. Read; will appear in the journal.

Notes on Graduated Labor in Pulmonary Tuberculosis. Surgeon R. C. Holcomb, U. S. Navy. Read and discussed; will appear in the journal.

After Surgeon Holcomb's paper had been discussed Major Paul Hutton, Medical Corps, U. S. Army, requested that Colonel Hickson be requested to continue his talk of the day before. This was accordingly done by the Chairman.

Colonel Hickson explained further relative to the practical instruction of medical officers in the British service as follows: First, he said that he was not a specialist in organization, but was in charge of the large hospital at Aldershot. Their system of training falls under two main heads: individual training in winter and collective training in summer. In winter lectures are given both by officers of the General Staff and by medical officers. In summer a group of officers of the Royal Army Medical Corps attend for staff tours. A medical staff tour comprises officers of the Royal Army Medical Corps under direction of an Assistant Director General of the Medical Services (Chief Surgeon) and an officer of the General Staff. The General Staff officer and the Chief Surgeon draw up a scheme which appears in operation orders and is given to all medical officers, two or three days in advance. First is a general idea and second a special idea. Every medical officer has to hand in an appreciation of the situation. This includes not only the medical arrangements, but also the military ones, for these officers are soldiers as well as medical men. A statement is required in regard to how much personnel and material will be required as are also comments on arrangements and sanitary recommendations.

Then a motor conveys the officers over the country. They are divided into two or three syndicates (older and younger medical officers). Changes are made from day to day. Having arrived at the scene of military operations on the evening before, appreciations are read and worked out for the following day and so on day

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by day. These are handed in on the day set and all work is done at night. The daylight is occupied in going over the ground and in making arrangements on the ground.

The divisional staff tour is a different thing. In this nearly all officers belong to the combatant branch with two or more medical officers. The scheme is carried out in much the same way, but it is wholly from the viewpoint of the fighting soldier. Medical officers give expert advice on medical arrangements. The work for each evening is much the same. In this the medical officer expresses his opinion and also advises in respect to operation orders.

Medical maneuvers bring medical officers from all over the country. They are placed with commands or with divisional medical units. In his assignment it makes no difference what duties an officer may have been on; for example, at the last maneuvers a medical officer on duty in a lunatic asylum was assigned to a sanitary unit. Two brigades of infantry were ordered out and were engaged for three days in attack and defense. Operation orders were issued and wounded were removed to a clearing hospital. It is certain that in peace there must be careful preparation for war. The speaker stated that it seemed to him that this work should inspire great interest in the Organized Militia. The civilian physician or surgeon is no good until he learns his military work, and is of little value even after he has learned regulations, manuals, etc. To be truly efficient he must profit from practical lessons. This was proved in South Africa. Civil surgeons of the highest professional attainments were of little value for the first few months. Everybody must have experience in war or training in peace. In the opinion of the speaker, lectures of General Staff officers and discussions among medical officers would be very valuable but, in addition, there must be practical work in summer.

Major E. L. Munson, Medical Corps, U. S. Army: "It seems that our English cousins have arrived at the goal for which we are striving. It is clear that they are progressive, and this is specially evident from the interest which they display in field training. We are now aiming to do what they are doing abroad. But so far the employment of two brigades has been quite beyond us. In Leavenworth and Ohio something has been accom-

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plished. Perhaps we of the medical corps are too modest. As a matter of fact, just four men run an Army, these are the general commanding, the chief of the general staff, the chief supply officer and the chief surgeon. The office of chief surgeon is wholly an administrative position, and for it the incumbent must know tactics and his training must be practical on the ground. Books and theoretical study are good, but they are not enough. They may have to go by the board in actual conditions in the field. An interesting condition was recently analyzed at Fort Leavenworth; a division was reduced to see effects and the only medical aid available was found in the trenches and at one field hospital. This was a good practical test." The speaker said further that he hoped the best men from the Guard might be sent to Leavenworth and that after the course was completed they would go home and start schools. "It is essential that a very select body represent Leavenworth, so that on going back to their states the medical officers will be able to carry the message. Doubtless the course at Leavenworth will be elaborated, but it will be kept thoroughly practical. Everyone going there will realize that team work is essential and that general staff and line officers will give great assistance. The medical department has stronger friends in the line than we are sometimes inclined to think. All that is necessary is to demonstrate our mission and then, in my opinion, we would command our support from the line and general staff and also from the National Guard."

A Case of Quinine Idiosyncrasy. Major G. M. Van Poole, Medical Corps, U. S. Army. Read by title and ordered printed.

Expansive Bullets. Their Use in Modern Warfare Should be Condemned. Colonel Eduardo R. Garcia, Republic of Mexico. Read by Surgeon F. E. McCullough, U. S. Navy; will appear in the journal.

Major W. S. Conkling, Medical Corps, N. G. Iowa, on behalf of a special committee, then presented Major Charles Lynch, the retiring Secretary and Editor, with a beautiful silver dish, which had been voted him by the association as an evidence of its appreciation of his services. In making this presentation, Major Conkling spoke briefly, saying that he desired to voice the appreciation of the Association.

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Major Lynch, in responding, said that he was deeply touched by this evidence of the kind esteem in which he was held by his many friends of the Association. He expressed the keenest regret that his official duties compelled him to resign the position of Secretary and editor. In looking back it would always be a source of special pleasure to him to remember that great progress had been made by the medical services while he was in office. Not that he felt that he had accomplished all this, for Major Munson, Captain Thomason and many others had done far more, but, as editor of the journal, he hoped that he had played a little part in the good work.

A Proposed Plan of Treatment of Gunshot Wounds of the Abdomen on the Battlefield by Anatomical and Physiological Test. Captain Allie W. Williams, Medical Corps, U. S. Army. Read and discussed; will appear in the journal.

In the course of the discussion of this paper Lieutenant Henry H. Arnold, U. S. A., of the Army Aviation School, was introduced. Lieutenant Arnold said he believed a very strict physical examination should be made of candidates for aviators. It is especially necessary to ascertain if the candidate can estimate distances correctly. Any flyer who does foolish and dangerous tricks should be immediately relieved from such duty. In these ways the fatalities would be much reduced in number. Lieutenant Arnold, also in speaking of the place which the art of flying has now attained, referred to a Wright machine which has made a great number of trips without accident or injury.

Brain Abscess as a Remote Effect of Gunshot Wounds of the Head. Major William Jepson, Medical Corps, N. G. Iowa. Read and discussed; will appear in the journal.

The Operative Treatment of Fractures. Captain George H. Parmerlee, Medical Corps, N. G. Mich. Read; will appear in the journal.

A Portable Positive Pressure Apparatus for Administration of Ether by Ultra-Tracheal Insufflation (Exhibit of Apparatus and Paper). Captain Allie W. Williams, Medical Corps, U. S. A. Read by title and ordered printed.

Remarks on Compound Fractures—With Report of a Case of Compound Fracture of Leg. First Lieutenant Armistead K.

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Tayloe, Medical Corps, N. G. N. C. Read by title and ordered printed.

Lieut. Colonel W. G. Schauffler, N. G. N. J., Chairman of the Committee on Resolutions, then stated that Colonel Maus desired to introduce certain resolutions, and he asked that the rule in reference to referring all resolutions to the Committee for report be suspended. The resolutions were then read; they appear in the minutes of the business meeting. By vote of the association it was decided not to suspend the rules in this case and the resolutions were withdrawn.

The Chairman of the Committee on Arrangements then made an announcement in respect to the time of the officers' ball.

The foreign delegates were then given an opportunity to speak. The representatives of China, Denmark, Great Britain and Mexico all said a few courteous words in respect to the benefit they had derived from the meeting.

Adjournment at 1:00 p. m.

Business Session, October 4, 1912.

3:15 O'CLOCK P. M.

President: "This is a business session provided to clean up all other matters which were not taken up in the earlier meeting of the Association. The first thing is the report of the Auditing Committee."

Surgeon McCullough (for the Committee):

Your Committee on the Audit of the Accounts of the Treasurer submits the following report:

REPORT OF AUDITING COMMITTEE.

We have made a careful audit of the accounts submitted by the Treasurer and compared same with the statement of chartered accountant.

In making this check, we selected two months at random and compared all bills, receipts, checks, etc., for said two periods. We found that there was on hand, to the credit of the Association, September 27, 1912, the sum of $3,411.54, for which certified check was duly presented by the Treasurer; and we, therefore,

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recommend that the report of the Treasurer be accepted, as submitted.

We find that on October 10, 1911, the balance on hand was $5,033.68; in other words, that the deficit for the year, just closed, was $1,622.14.

This condition seemed to demand more detailed examination, and we, therefore, have made some analysis of the figures and present the following results—the figures being practically exact, any divergence to be found by a detailed tabulation of all figures being due to estimates of amounts of some smaller items, items negligible in amount. This qualification relates solely to the minor office expenses of the Secretary and Treasurer—for receipts as a whole, the figures are practically exact.

We find that the total income from the Journal was $4,769.88, and that the expenses of the Treasurer's office were $798.30, including $300.00 for salary and $109.50 for expenses of Treasurer in attending the Annual Meeting; the balance, $389.00, being covered by postage, express, safe-deposit box, auditor, etc.

We find that the expenses of the Secretary's and Editor's offices were $8,019.14, made up of the following:

Printing and mailing Journal	$4,497.96
Salary of Secretary	1,200.00
Salary of Clerk to Secretary	1,200.00
Traveling expenses of Secretary and Clerk (attending Annual Meeting)	194.20
Office rent	420.00
Telephone	57.00
Postage (approximately)	200.00
Minor expenses (approximately)	250.00
	$8,019.14

In other words, the cost of running Journal on the present basis is, approximately, $3,449.26, in excess of the income from the same source.

The Journal brings in	$4,769.82
The Journal costs, exclusive of expenses of Secretary's and Editor's office	4,497.76
The net income is	$272.12

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The fact seems to be that another two years on the present basis will consume the income from memberships, etc., and, in addition, wipe out the last of the surplus. The responsibility for this condition rests, not upon any individual or individuals, but upon the Association itself. It established the present organization and it has continued it for three years in the face of growing deficits.

In view of these facts, we submit the following recommendations, and we make them with a full sense of the work done by the present Secretary and Editor, make them only because driven to them by the exigencies of the case:

1. That the present office be closed November 1, 1912.

2. That a Secretary and Editor be elected who shall receive $1,000 per year in lieu of all salary and expenses, other than office expenses at Annual Meeting.

3. That the present Secretary and Editor be earnestly requested to continue in office until January 1, 1913, on the new terms, if he can do so without too great a personal sacrifice.

4. That if he cannot do this, the new Secretary take office November 1, 1912.

Respectfully submitted,

(Signed) JOHN VON D. HOFF.
ALBERT H. BRIGGS.
D. S. FAIRCHILD, JR.
F. E. MCCULLOUGH.
G. B. YOUNG,
Secretary.

October 1, 1912.

President: "You have heard the report of the Auditing Committee. It is now open for discussion. There are some very radical recommendations and the matter should be thoroughly discussed. We should express our views with great freedom as to what is best to be done."

After an animated discussion participated in by practically all members present, the report of the Auditing Committee so far as it related to the accounts of the Treasurer was adopted. The

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second recommendation of this committee was amended to read as follows: $1,800.00 for $1,000.00 and was so adopted. By vote of the meeting the Executive Committee was empowered to make the necessary arrangements in reference to the closing of the office of the old Secretary and Editor and the transfer to the new Secretary and Editor.

In the course of this discussion it was proposed that the journal be made a quarterly instead of a monthly as at present. This was not favored by the majority of members present.

Lieut. Colonel Reichelderfer then asked if a resolution in respect to the delinquency of members had been passed.

Lieut. Colonel Schauffler, Chairman of the Committee on Resolutions, explained what had been done in this respect.

A motion was then adopted that the resolution amending the by-laws, Section 2, Article IV, introduced by Lieut. Colonel Kean and reported amended by the Committee on Resolutions and adopted October 1, 1912, be reconsidered. It was finally agreed that the portion of that amendment which related to the black list be struck out.

Major Taneyhill then moved that the committee on the button consist of five members, one each from the Army, Navy, Public Health Service, National Guard, and the President elect. This is to amend Paragraph 2, Section 2, Article IV of the Constitution. This motion was made at this time so that action may be taken next year. It was so adopted.

Act. Assistant Surgeon Marsh then reported as follows for the Committee on Resolutions:

BE IT RESOLVED, That the Association of Military Surgeons of the United States send two delegates to the next meeting of the National Guard Association. These delegates to be chosen by the President, who shall appoint one delegate from the Organized Militia.

This was adopted with the understanding that this would involve no expense to the Association.

Act. Assistant Surgeon Marsh, Acting Chairman, Committee on Resolutions, then reported without remark the following resolution by Colonel L. Mervin Maus, Medical Corps, U. S. A., which had been regularly referred to the Committee:

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WHEREAS, One of the principal objects of the organization of the Association of Military Surgeons of the United States is the preservation of life, health and efficiency in the military services, and

WHEREAS, Scientific investigation and study have proven that the continued use of alcoholic beverages, even in moderate quantities, is a potent factor in the causation of diseases and the reduction of military efficiency, therefore, be it

RESOLVED, That it is the opinion of the Association of Military Surgeons of the United States that the use of alcoholic beverages should be discouraged among the military and naval forces, especially during active service.

After some discussion the author of the resolution proposed to omit the words "even in moderate quantities" which were objected to by some members present as unscientific. After further discussion the resolutions were not adopted. While all members entering into the discussion stated that they recognized the dangers from the abuse of alcohol, they objected to picking out alcohol from the other causes affecting the efficiency of the fighting forces, and were also doubtful if any practical good would be accomplished through resolutions of this character. It was further stated that the abuse of alcohol was now and always had been discouraged in the various services, and it was therefore useless to adopt resolutions to this effect.

Acting Assistant Surgeon Marsh then introduced the following resolutions:

WHEREAS, The hour of adjournment of the Meeting of the Association of Military Surgeons has now arrived, therefore,

BE IT RESOLVED, That the thanks of the Association be tendered

1. To the charming members of the ladies committee of which Mrs. Edwin J. Farber was Chairman, for the many courtesies extended to the ladies of the Association, whereby their pleasures were so greatly enhanced.

2. To His Excellency, Governor Philip Lee Goldsborough, His Honor, Mayor James H. Preston, Dr. Hugh H. Young, President of the Medical and Chirurgical Faculty of Maryland, and Colonel William L. Quarles on behalf of the Volunteer Organizations of Greater Baltimore, for their gracious words of welcome to this fair city.

3. To Captain John H. Gibbons, U. S. N., Commandant of the U. S. Naval Academy, his officers and the ladies for their courtesy extended to this Association during its visit to Annapolis.

4. To the Adjutant General of the State of Maryland and to the Officers of the National Guard of Maryland for their courtesy.

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5. To the Medical and Chirurgical Faculty of Maryland for the use of their fine building.

6. To the following hospitals for the kind invitations to attend clinics especially arranged for the members of the Association: The Johns Hopkins Hospital, University Hospital, Franklin Square Hospital, Presbyterian Eye, Ear and Throat Hospital, Maryland General Hospital and Mercy Hospital.

7. To the Maryland Club, Baltimore Club, Baltimore Athletic Club and Arundel Club for the courtesies extended to the members and ladies of the Association.

8. To Captain J. Harry Ullrich and his able corps of assistants of the Committee of Arrangements and Reception Committee for the many social pleasures enjoyed on this memorable occasion.

9. To the officers and ladies of Fort Howard for their kind invitation.

10. To the Directors of the Rosewood State Training School for Feeble-Minded Children for their invitation to visit the school.

11. To the Management of the Belvedere Hotel for courtesies extended the Association.

12. To the Press of Baltimore City for the complete reports of the daily proceedings of the meeting.

13. To all the public-spirited citizens of this hospitable city who have contributed in any way to make the Baltimore Meeting such an enjoyable occasion.

Unanimously adopted.

President: "In giving up the office of president, I wish to say that I deeply appreciate the honor that was conferred on me by my election to the presidency of this Association I take much pleasure in turning the office over to one whom I am sure will do all in his power to create and maintain interest in the Association. I will ask Colonel Maus and Colonel Weaver to escort the new President to the Chair."

Surgeon W. C. Braisted, U. S. N., the new President: "I believe, gentlemen, that it is the custom for the new President on being inducted into office to express appreciation of the honor conferred. I wish to say frankly that I was somewhat depressed at having watched the Association during the past year, but the Baltimore Meeting has changed my ideas and I look forward with a hopeful feeling for the Association for many years to come."

Surgeon Braisted's speech of acceptance of the office of President of the Association appears elsewhere in this issue.

On the conclusion of this speech, at 5:30 p. m., there being no further business before it, the Association adjourned sine die.

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SOCIAL PROGRAM AT BALTIMORE

The Association of Military Surgeons is greatly indebted to the local committees for the success of the Baltimore Meeting. These committees were made up as follows:

Committee of Arrangements.—Captain J. Harry Ullrich, Medical Corps, Md. N. G., Chairman; Colonel Chas. A. Little, Colonel Louis Rawlins, Colonel Harry C. Jones, Captain Ralph Robinson, Captain Paul Burnett, Major Alexius McGlannan, Major Robert P. Bay, Major Guy W. Townsend, Dr. A. C. Harrison, Dr. Hugh Young, Colonel Robert W. Johnson, General A. D. McConachie, Dr. John G. Hemmeter, Dr. W. S. Gardner, Dr. Emil Novak, Dr. Rupert Norton, Dr. Charles O'Donovan, Dr. Jos. Bloodgood, Dr. Jno D. Blake, Dr. Thos. L. Richardson, Dr. Chas. G. Hill, Dr. Thad Clark, Dr. Henry W. Kennard, Dr. Arthur W. Shipley.

Reception Committee.—General Charles F. Macklin, the Adjutant General of Maryland, Chairman; Dr. Jos. H. Wilson, Dr. Jos. Bloodgood, Dr. Harvey Cushing, Dr. J. M. T. Finney, Dr. Albert Halstead, Dr. W. S. Thayer, Dr. Wm. S. Baer, Dr. Julius Friedenwald, Dr. Louis Hamman, Dr. Alex. McGlannan, Dr. Frank Martin, Dr. Isaac Pels, Dr. Arthur M. Shipley, Dr. Marshall L. Price, Dr. Thos. R. Chambers, Dr. J. A. Chatard, Dr. Edgar G. Friedenwald, Dr. Herbert C. Knapp, Dr. Standish McCleary, Dr. Duncan McCalman, Dr. Chas. H. Riley, Dr. John A. Tompkins, Dr. Randolph Winslow, Dr. Walter D. Wise, Dr. Rupert Norton, Dr. Charles E. Simon, Dr. M. L. Todd, Dr. W. C. Lyon, Dr. Jno. D. Blake, Dr. Robert C. Caldwell, Dr. John S. Fulton, Dr. C. B. Gamble, Jr., Dr. Clifford T. Sappington, Dr. St. Clair Spruill, Dr. Nathan Winslow, Dr. Charles F. Blake, Dr. Harvey G. Beck, Dr. Ed. E. Lambkin, Dr. Edgar S. Linthicum, Dr. Wm. W. Requardt, Dr. Howard E. Ashbury, Dr. George L. Taneyhill, Dr. B. M. Bernheim, Dr. J. Harry Ullrich, Dr. Samuel J. Fort, Medical Inspector Albert M. D. McCormick, General Charles F. Macklin, General Herbert Harlan, Major Paul C. Hutton, Medical Corps, Dr. Lewellys F. Barker, Dr. John G. Jay, Dr. Howard A. Kelly, Dr. John B. Schwatka, Dr. Hiram

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Woods, Dr. Jos. Bosley, Dr. C. Hampton Jones, Dr. Wm. S. Love, Dr. Ridgley B. Warfield, Dr. Robert L. Randolph, Dr. John S. Fulton, Dr. Hugh H. Young, Medical Inspector George Pickrill, U. S. N., Passed Assistant Surgeon Howson White Cole, Jr., U. S. N.

Ladies' Reception Committee.—Mrs. Edwin J. Farber, Chairman; Mrs. Charles F. Macklin, Mrs. Felix Agnus, Mrs. Charles A. Little, Mrs. George Reuling, Mrs. Hugh Young, Mrs. Tunstall Taylor, Mrs. Harry C. Jones, Mrs. W. W. Ford, Mrs. Ralph Robinson, Mrs. Paul M. Burnett, Mrs. Oscar Leser, Mrs. Alexius McGlannon, Mrs. John H. Adams, Mrs. Clement Penrose, Mrs. J. C. Hemmeter, Mrs. Howard A. Kelly, Mrs. W. Guy Townsend, Mrs. A. C. Harrison, Mrs. J. M. T. Finney, Mrs. Frank Martin, Mrs. Louis Rawlins, Mrs. Robert W. Johnson, Mrs. A. D. McConachie, Mrs. Richard Urquhart, Mrs. W. S. Gardner, Mrs. Charles O'Donovan, Mrs. Frank Turner, Mrs. John Bloodgood, Mrs. J. Morris Slemmons, Mrs. Adolph Meyer, Mrs. Frank Smith, Mrs. Frederick Tyson, Mrs. Wm. S. Thayer, Mrs. Thomas L. Richardson, Mrs. Charles G. Hill, Mrs. Nathan Winslow, Mrs. J. Harry Ullrich, Mrs. August Weber, Mrs. Richard Pleasants, Jr., Mrs. Wm. S. Baer, The Misses Hurd, Miss Clara Turnbull Waite, Miss Eliza Winslow, Miss Emma Weber, Miss Marguerite Ravillon, Miss Margaret Elliott, Mrs. Pierce Kinsing, Mrs. Wm. D. Gill, Mrs. Randolph Winslow, Mrs. Douglas H. Gordon, Mrs. Thos. B. Futcher, Mrs. Wm. Ellis Coale, Mrs. Henry Thomas, Mrs. Walter Abell, Mrs. Sherlock Swann, Mrs. DeCourcey W. Thom, Mrs. James P. Gorter, Mrs. Winford Smith, Mrs. Jas. H. Preston, Mrs. Robert Garrett, Mrs. Samuel Chew, Mrs. McLane Tiffany.

It is not only to the members of these committees, however, that the indebtedness of the Association should be acknowledged, but also to many other residents of Baltimore whose courtesy contributed very materially to making the meeting in that city a success.

On Monday evening an informal reception was held at the Belvedere Hotel. Unfortunately, on account of the few delegates present so early in the week, and a meeting of the Executive Council on the same evening, this was not as largely

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attended as would have been the case under more favorable circumstances.

On Tuesday from 9:00 a. m. to 4:00 p. m. clinics were scheduled at the Johns Hopkins University, Mercy, Maryland General, Franklin Square and Presbyterian Eye, Ear and Throat hospitals. Universal regret was expressed that the business meeting prevented many members from attending these clinics. Of course, all who were able to go profited largely from what they saw. Baltimore is so generally recognized as a great medical and surgical centre that the opportunity of meeting the brilliant local representatives of the medical profession was regarded as a spcial honor by all the members of the Association in attendance.

On Tuesday evening a beautiful reception was given for the President of the Association in the ball room of the Hotel Belvedere. This was attended by many people prominent in the social and professional circles of Baltimore. The uniforms and the handsome dresses of the ladies resulted in a scene which has rarely been rivaled for brilliancy at any meeting of the Association.

On Wednesday at 4 o'clock in the afternoon a special party from the Ladies' Reception Committee, headed by Mrs. W. S. Baer, took the wives and daughters of delegates in attendance at the meeting for an automobile trip through Green Spring Valley. In returning tea was served by Mrs. Hugh H. Young at the Baltimore Country Club.

After the public meeting on Wednesday evening a very enjoyable smoker was given at the Baltimore Club.

Thursday was a specially busy day, so far as entertainment was concerned. Shortly after noon the delegates, their families and representatives of local committees assembled at the Mount Royal Station. About three hundred were in the party. A special train was provided to take everyone present to Annapolis. A picnic lunch was served on the train going down. Governor Goldsborough of Maryland again gave up much of his valuable time to the Association. His reception was held in the State House, and the visitors were introduced to the Governor by General Charles F. Macklin, Adjutant General of

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Maryland, and General William D. Gill, of the Governor's Staff. On leaving the State House, motion pictures and other photographs were taken on the steps. Part of the Governor's reception was re-enacted here for the benefit of the moving-picture men.

Later a reception was given in the quarters of Captain Gibbons, U. S. N., Superintendent of the U. S. Naval Academy. A number of officers of the Academy Staff assisted Captain Gibbons in receiving. Many ladies were also in the receiving line. The warm welcome which the Association received at the Naval Academy was deeply appreciated by all present. As the train on which the party returned to Baltimore did not leave Annapolis till 5.00 p. m., ample time was afforded to see the magnificent new buildings which the government has provided for its Naval Academy.

On the evening of Thursday the ladies' reception committee gave a theatre party for all in attendance at the meeting. This was at the New Academy of Music, where an excellent vaudeville performance was witnessed.

The final feature of the meeting was a ball on Friday night given in honor of the visitors by the officers of the Maryland National Guard. This was held in the Fourth Regiment Armory. A very large company was present and all thoroughly enjoyed the evening's entertainment.

Saturday saw the departure of all who had remained for the ball. Members of the Committee on Arrangements sped the parting guest in happy fashion; that is to say, in as happy fashion as they could, for no one wished to leave the city, where their stay had been made so thoroughly enjoyable.

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NEWS OF THE SERVICES

Major Elbert E. Persons, Medical Corps, who was recently in command of Field Hospital No. 2, Presidio of San Francisco, Cal., has been relieved from such duty and assigned to duty at the Army War College, Washington, D. C.

Major Harry L. Gilchrist, Medical Corps, recently surgeon at Fort Omaha, Neb., has arrived in Washington and is on duty in the Division of Militia Affairs, relieving Captain Henry D. Thomason, Medical Corps, who upon taking four months' leave of absence will take station at Whipple Barracks, Arizona.

The officers of the Medical Corps on duty in the city of Washington have recently completed the ninety miles' test ride.

Colonel William W. Gray, Medical Corps, has been ordered to report to the president of a retiring board for examination.

Captain Mahlon Ashford, Medical Corps, is on leave of absence from Fort D. A. Russell and is visiting in Washington, D. C.

The many friends of Major General Robert M. O'Reilly, retired, formerly Surgeon General of the Army, will regret to learn of his serious illness at his home in this city, 1825 Q street northwest.

The session of the Army Medical School commenced on October 1 with 26 student officers in attendance. Colonel L. A. La Garde, Medical Corps, former Commandant of the School, has been relieved from that duty to permit his assignment to duty in the Surgeon General's Office. Colonel Charles Richard, Medical Corps, is now Commandant of the School.

Colonel Henry P. Birmingham, Medical Corps, has been assigned to the command of the Walter Reed General Hospital, Takoma Park, D. C.

Lieutenant Colonel Merritte W. Ireland, Medical Corps, recently of the Surgeon General's Office, has been assigned to duty as Surgeon at Fort William McKinley, Rizal, Philippine Islands.

Major Leigh A. Fuller, Medical Corps, has been relieved from duty at Fort Leavenworth, Kansas, and assigned to station at Fort Brady, Michigan.

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Captain Clarence H. Connor, Medical Corps, from Fort Brady, Michigan, has been ordered to Fort Wood, Bedloes Island, New York, for duty.

Lieutenant Colonel Charles E. Woodruff, Medical Corps, has been relieved from duty as Sanitary Inspector, Western Division, and ordered to the Walter Reed General Hospital, Takoma Park, D. C., for observation and treatment.

Lieutenant Colonel Euclid B. Frick, Medical Corps, has been detailed as Sanitary Inspector of the Western Division.

Lieutenant Colonel Henry I. Raymond, Medical Corps, who has been spending a leave of absence in the United States, will return to his station, Schofield Barracks, Hawaiian Islands, on the November transport.

Colonel H. O. Perley, Medical Corps, has recently been in Washington, D. C., on leave from Fort Leavenworth, Kansas.

Lieutenant Colonel Francis A. Winter, Medical Corps, of the Surgeon General's Office, visited the Supply Depot in St. Louis, Missouri, during the week in connection with the assembling, storing, and care of field medical supplies and other matters connected with the supplies of the Medical Department of the Army.

Brigadier General George H. Torney, Surgeon General, was a delegate to represent the Medical Department of the Army at the National Association for Preventing the Pollution of Rivers and Waterways, held in Cleveland, Ohio, October 23 and 24, 1912. General Torney was elected President of the Association for the ensuing year.

The following Surgeons of the Public Health Service were during the month of Sepetmber ordered to report to examing boards for the determination of their fitness for promotion to the grade of Senior Surgeon: Hiram W. Austin, George W. Stoner, Frank W. Mead, Charles E. Banks, James M. Gassaway, Henry R. Carter, Parker C. Kalloch, and Duncan A. Carmichael.

Surgeons George W. Stoner and J. H. White and Passed Assistant Surgeon R. H. von Ezdorf, of the Public Health Service, were detailed during the month of September to attend the International Congress on Hygiene and Demography, held in Washington.

Passed Assistant Surgeon John S. Boggess, of the Public Health Service, recently on duty at the Hygienic Laboratory in Washington, is at present in temporary charge of the Mobile Quarantine Station.

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Passed Assistant Surgeon W. H. Frost, of the Public Health Service, spent a large part of the months of September and October in an epidemiological study of the occurrence of poliomyelitis in Buffalo, New York, and other localities in western New York.

Pursuant to an Act of Congress approved August 24, 1912, making appropriation to enable the Public Health Service to conduct an investigation as to the prevalence of tuberculosis, trachoma, smallpox, and other contagious and infectious diseases among the Indians of the United States, the following officers of the Public Health Service have been detailed to conduct field investigations: Surgeon Taliaferro Clark, in Iowa, Minnesota, and Wisconsin; Passed Assistant Surgeon M. J. White, in Montana; Passed Assistant Surgeon L. D. Fricks, in Arizona; Passed Assistant Surgeon W. C. Billings, in California, Nevada, and Oregon; Passed Assistant Surgeon J. W. Schereschewsky, in North and South Dakota; Passed Assistant Surgeon B. J. Lloyd, in Washington and Idaho; Passed Assistant Surgeon F. C. Smith, in New Mexico; Passed Assistant Surgeon M. C. Guthrie, Oklahoma, and Passed Assistant Surgeon R. A. Herring, in Kansas, Nebraska, Wyoming, Colorado, and Utah.

Passed Assistant Surgeon C. H. Lavinder, of the Public Health Service, was made President of the National Conference on Pellagra, held in Columbia, South Carolina, October 2 to 4, 1912.

During the month of September Passed Assistant Surgeon L. L. Lumsden, of the Public Health Service, spent some time investigating the prevalence of typhoid fever in Clinton, Iowa, and vicinity.

Passed Assistant Surgeon A. J. McLaughlin, of the Public Health Service, was detailed upon the request of the chairman of the American Section of the International Joint Commission to attend the sessions of the Commission, held in Ottawa, Canada, during the early part of October, for the purpose of furnishing expert advice to the members of the Commission relative to the pollution of streams in international waters.

Assistant Surgeons Paul Preble and R. M. Grimm, of the Public Health Service, were detailed during the month of October to appear before a board for examination as to their fitness for promotion to the grade of Passed Assistant Surgeon.

Assistant Surgeon J. P. Leake, of the Public Health Service, has been for some time in Buffalo, New York, investigating, in connection with Passed Assistant Surgeon Frost, the cases of poliomyelitis occurring in western New York.

Passed Assistant Surgeon J. A. Nydegger, of the Public Health Service, recently on duty at the Marine Hospital at Stapleton, New York, has been

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detailed for duty at the Marine Hospital in Baltimore, Maryland, where he relieved Passed Assistant Surgeon Dunlop Moore, who has been placed on duty at Ellis Island, New York.

Surgeon Fairfax Irwin, of the Public Health Service, who for the last three years has been on duty at Yokohama, Japan, has been ordered to Boston, Massachusetts, for duty. Surgeon B. W. Brown, who has been for some time at Hongkong, China, relieved Surgeon Irwin at Yokohama.

Passed Assistant Surgeon Norman Roberts, of the Public Health Service, who for some time has been on duty in the Division of Chemistry of the Hygienic Laboratory at Washington, has been ordered to Gloucester City, New Jersey, for duty in connection with the examination of immigrants.

Committee appointments for the coming year will be announced in the December number of the journal, where will also appear the usual biographies of the new officers of the association.

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The Military Surgeon

Vol. XXXI. DECEMBER, 1912 No. 6

ORIGINAL ARTICLES.

AUTHORS ALONE ARE RESPONSIBLE FOR THE OPINIONS EXPRESSED IN THEIR CONTRIBUTIONS.

THE MEDICAL DEPARTMENT OF THE UNITED STATES ARMY IN THE CIVIL WAR.

Pope's Virginia Campaign.

BY CAPTAIN LOUIS C. DUNCAN, MEDICAL CORPS, U. S. ARMY.

"Le soldat sait mourir pour son pays, il est habitué à l'idée d'être frappé par un balle enemie. Par contre l'esprit de sacrifice n'est suffisament developpé pour lui permettre de supporter des suffrances q'il judge inutiles. Il rapporte a ses chefs la cause de ses miseréres, et la demoralization est la consequence."

GENERAL SITUATION AND MOVEMENTS.

A LOST campaign will always show the medical department of an army at its worst. Even with a complete, well organized and equipped sanitary corps, many of the wounded will be left behind, and great suffering cannot be avoided. With an untrained corps, such as existed in this campaign, the fate of the wounded will be much like those of the battles of the Middle Ages; but without that callousness to suffering which existed even among civilized peoples at that time.

The Virginia Campaign of General John Pope, in 1862, was the most unfortunate large campaign of the whole war. A miscellaneous aggregation of corps, under generals ranging from

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mediocre to poor, or worse, marched ceaselessly and fought bravely for a month. The end was miserable failure which left the army within the fortifications of Washington, just where it had been when the war began. All the efforts up to this time had gone for nothing. One can scarcely read of it all even today without a feeling of humiliation and regret that such noble efforts on the part of subordinate officers and soldiers should have been rendered useless by blundering generals; that all the suffering and death on those fields should have accomplished nothing toward ending the war; even less than nothing.

After the failure of McClellan's Peninsular Campaign it was decided to withdraw his army by water to Alexandria, in order to unite it with another force, to be collected in front of Washington. This was done during August, leaving the Confederate Army free to move where it pleased. To protect Washington and draw off Lee from McClellan's embarkation, another army was formed, known as the Army of Virginia. Its life was brief.

The three small armies of Sigel (formerly Fremont), Banks, and McDowell were brought together above Culpeper on the last of July and placed under the command of General John Pope; a boaster who accomplished as much as men of his class usually accomplish. The psychology of this whole campaign would make an extremely interesting study. It was not neglected by Lee and Jackson. They appraised Pope as they had appraised McClellan; and with accurate precision.

McClellan's army came to Alexandria in fragments. Lee could not, and did not allow the two armies to unite, without first striking Pope. In spite of the exhaustion and losses of the Seven Days' Battle, and the danger of leaving Richmond unprotected, he hurried Jackson to the Rapidan early in August and by the 20th was behind the Rappahannock with his whole army, determined to strike Pope before McClellan should join him. This, thanks to the blundering or worse of incompetent Union generals, he was able to do.

Pope's army at first consisted of three corps, each of two divisions, and numbered about 35,000 men. On August 14th Reno brought two divisions from Burnside's Corps at Fredericksburg, giving Pope another small corps. On August 23rd Reynolds joined McDowell with the fine division of Pennsylvania Reserves, greatly depleted, however, at this time. A few days before

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the great battles Porter and Heintzleman joined with two corps from the Army of the Potomac. This gave Pope six small corps with about 65,000 men. There was also some cavalry, probably 5,000 in all, which accomplished little or nothing more than killing their horses. It will be seen that this was not a homogeneous force. It was a collection of separate corps and did not work in harmony; far different from the experienced, compact, smooth-working, efficient machine it was to oppose.

Pope's duty was to defend Washington and draw off the Confederates from the James; but his boastful proclamations almost compelled him to take the offensive and march to the front. So the campaign began at Cedar Mountain below Culpepper, early in August. Beaten there, Pope gradually fell back along the Orange & Alexandria Railway, which was his line of communications. As Lee and Jackson were continually attempting to turn his right flank, the fighting all took place west and north of the railway. The Warrenton Pike, a few miles to the north, was the main line of wagon road and on it most of the battles occurred.

Banks was beaten at Cedar Mountain on the 9th and Pope fell back to the Rappahannock on August 19th. On August 26th that position was turned, bringing Pope back to Gainesville. On the 28th he went back to Bull Run. The principal battle occurred on the 29th and 30th, resulting in decided defeat. On the 31st the army was at Centreville, on September 1st at Fairfax, and on the 3rd the troops were withdrawn within the fortifications of Washington. Two more Corps of the Army of the Potomac had joined the army on the 1st, but it was too late, the most unfortunate campaign of the war was ended. Pope's career had closed. He refused to see facts, seeing only what he wanted to see. The army fought well and suffered severely. The soldiers bravely strove, in so far as they were able, to atone for the faults of their leaders. Had they been less brave or the leaders more able, the losses would not have been so severe or the story so miserable a one to tell. Repeatedly pushed into suicidal positions, and not knowing that they were unsupported on either side, they deemed it their duty to stand, and they stood until often in danger of being surrounded and captured. No more steadfast fighting was seen during the war than in the wheatfield at Cedar Mountain, the field of King's battle near Gainesville, and in front

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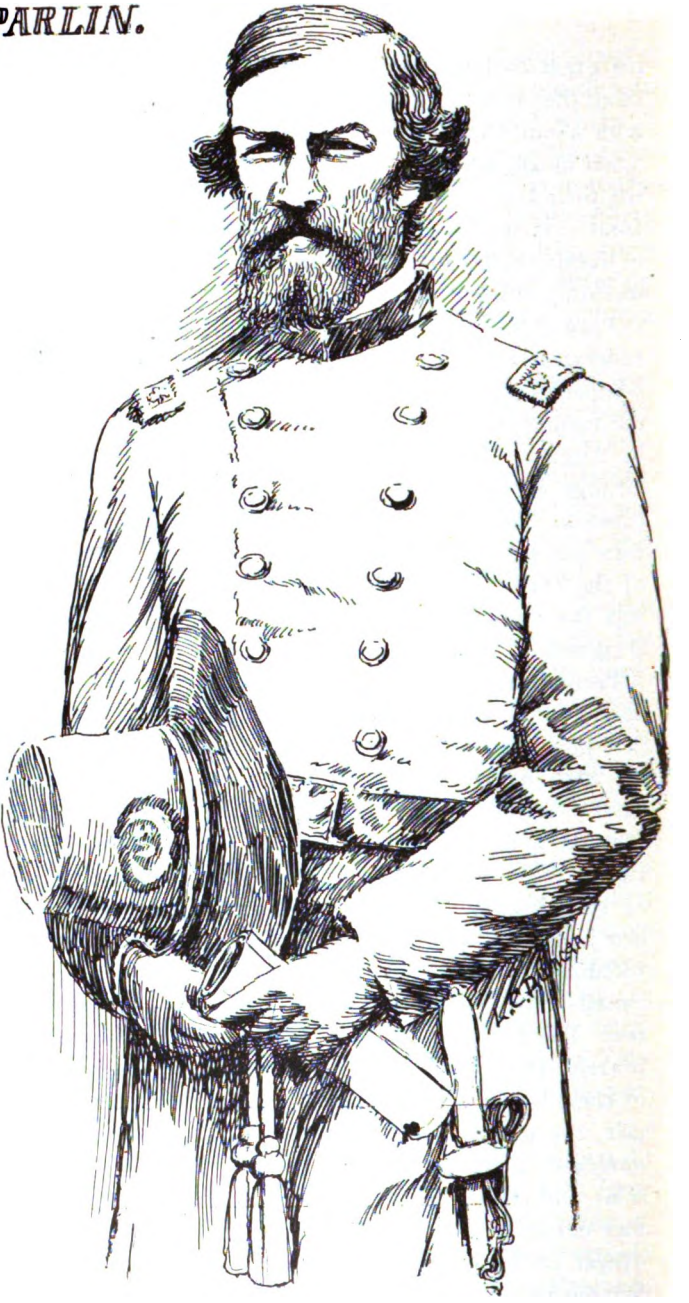
MCPARLIN.



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of the railway embankment where Grover's Brigade made a charge which actually merits that overworked word gallant.

MEDICAL PLANS, ORGANIZATION AND EQUIPMENT.

Pope's army was like a scratch ball club. Various corps were suddenly brought together and plunged into an active campaign before they could be organized for team work. The medical department was like the balance, various, incomplete and not well organized.

The medical director of the army was Surgeon Thomas McParlin, U. S. Army, a competent man, who afterwards conducted the medical department of the Army of the Potomac through its greatest campaigns with eminent skill and success. In this campaign he had clear ideas and some plans, yet the outcome was largely a failure. The reasons for this will be pointed out.

The country from the Rapidan back to Washington is a gentle rolling one with woods and cleared fields, traversed by passable roads. The weather during August was generally fine though excessively warm during the early weeks. Washington was the base with the Orange & Alexandria Railway for the line of communications. This road had been so often destroyed that it was in poor condition and the locomotives and cars were diminutive as compared with those in use today. Supplies were brought forward by this line, wounded evacuated by it, and the army clung to it throughout. The towns of Culpepper, Warrenton and Manassas were conveniently located for temporary bases of supply and hospitals.

The campaign began on the Rapidan with the supplies and hospitals at Culpeper. On August 19th they were removed to Bealeton Station. On the 27th they came back to Bristoe Station. Here the railroad was broken, and wagons had to be used to Centreville, and Fairfax Station, which was the main hospital on September 1st. By September 3rd everything was back in Alexandria.

Medical organization at this period of the war was crude. The ambulance corps idea was new. Letterman's order was issued on August 2nd, one week before Cedar Mountain. Porter's and Heintzleman's corps, coming from the Army of the Potomac, had their ambulance corps organized, but most of the ambulances were left behind at Yorktown or Alexandria. They marched

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out without wagon trains, some divisions without artillery, or even ammunition wagons; and with field officers on foot. It is hardly necessary to say that their troops had no ambulances.

As an example of what may happen, or rather will happen, in war, take the case of the Regular Division (Sykes) of Fitz John Porter's Corps; which it seems should have been supplied, if any. Asst. Surgeon A. A. Woodhull says, "There were no ambulances with the division from the evacuation of the Peninsula until we entered Maryland," that is during the entire time this corps was with Pope's army. Reynolds' Division, the Pennsylvania Reserves, probably the best volunteer division that the war produced, also had not a single ambulance.

All the divisions were not so badly off. McParlin says that Heintzleman's divisions had a well-organized ambulance corps. In the three original corps there were no ambulance organizations by divisions. McParlin says that the Surgeon General sent him the Letterman plan, but he had no time to put it in operation. He does not say that it was ordered, and it was not ordered at this time. It seems probable that the Surgeon General only recommended the plan, somewhat as a trial, and shortly before the battles.

These three corps had, of course, some ambulances when brought together. In McDowell's corps there were supposed to be three ambulances and one transport cart to each regiment. Actually there were but 41 ambulances and transport carts for 33 regiments. The shortage was 129. McParlin says: "As the report showed this corps to be the best supplied, the deficiencies of the other corps may be imagined." Of the transport carts he said, "The transport carts are useless, especially in a mountainous country. They kill numbers of horses, are slow at the best, and if used except for instruments and dressings will probably have to be abandoned by the road." He also said that the heavy four-horse ambulance was inferior to the two-horse ambulance, and this was the general opinion during the war. The General Ambulance Order of 1863 prescribed the two-horse ambulance. A full supply of ambulances and other stores was asked for, but few of them were received. The Quartermaster at Alexandria promised finally to send them on August 23rd, but the crowded trains prevented them and three days later the road was broken

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for good. The order of transportation at that time was: 1st Ammunition, 2nd Rations, 3rd Forage, 4th Medical supplies.

The Ambulances were sufficient for small engagements, but when the great two days' battle occurred near Bull Run, they were totally inadequate, even had they been organized in division trains. The Surgeon General had to be called on for ambulances; he forcibly gathered up a train of hacks and vehicles of all kinds from the streets of Washington and sent them to the field to bring in the wounded. This extemporization took the place of a service of the rear, which did not exist.

Letterman's field hospital plans had not yet appeared. Field hospitals were to be established in houses, barns and other buildings as at Bull Run, and McParlin's idea was to establish not division, or even corps hospitals, but one great field hospital in the rear for the whole army. This plan failed. An army of 60,000 men in battle could not be served by one hospital, even with the contracted lines of those days. When the battle came he established his hospital on Bull Run, a central and safe place, but too far away for that period, being from four to six miles from the wings. Each regiment had two or three hospital tents and this was the only hospital tentage with the army.

There were something like clearing hospitals that followed the army; or rather preceded it, for it was always retreating. Three hundred hospital tents were held in readiness at Alexandria at the beginning of the campaign, and two hundred were shipped to Warrenton where they were afterwards used. McParlin did not intend to retain sick and wounded in the field, or to establish any general hospitals except at Alexandria. The distance to that point was short and the railway convenient. He says: "The railroad made our communication easy and speedy with Alexandria. I proposed to use it for transportation of wounded from depots near the field. It was impossible to hazard locating, and there was no time for organizing large hospitals nearer to the scene of expected battle."

A wise plan would have been to set up tent hospitals at Culpepper, and later at Warrenton Junction (now Calverton). He was obliged to depart from his plan, and organized hospitals at Culpepper, and at Warrenton, which was rather off the main line of operations. The base hospitals were at Alexandria. When filled the patients were evacuated to Washington, and these

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cleared in turn by sending them farther north. A tent hospital was also set up at Falls Church.

No systematic supply scheme had yet been devised for the armies. A plan somewhat out of the ordinary was tried. It did not prove an entire success, but it was a definite plan. McParlin says that the Surgeon General intimated that purveyors trains for each army corps were not suitable for this campaign on account of the increased risk of loss of supplies by that plan, but that one supply depot for the whole army would be most judicious; this depot to be at Alexandria. Had the army remained at Centreville, and it would have been better there, this plan would have been good. But when the army reached Culpepper McParlin soon found that it was a failure; and that it was absolutely necessary to have supplies with the army. He still clung to the idea of centralization. He says: "No other purveyor's depots for corps (except Sigel's) were organized. I soon found, however, that a small moveable depot would be necessary to furnish battle-field supplies; such as instruments, anesthetics, concentrated nourishment, cooking utensils, blankets, bedding and tents."

These supplies were secured, but instead of loading them in wagons as was generally done, they were packed in box cars and forwarded to Warrenton. From there they went on to Culpepper for the Battle of Cedar Mountain. Afterwards these cars came back to Warrenton Junction. McParlin was so pleased with his railway supply train that he had two cars fitted up with shelving for ready issue. This train seems to have been extremely useful while it lasted. When Warrenton was evacuated the supply trains came back toward Manassas, but Jackson had destroyed the bridges about Manassas, and the trains stopped at Bristoe. The army was defeated, the bridges were not repaired in time to remove the trains, and they were all burned on August 31st. So ended the railway supply trains. But the idea was a good one and not to be condemned on account of the outcome, which was not chargeable to the plan, but to the failure of a campaign that was a succession of blunders, if not worse. In fact these trains might have been removed, had not Pope sent such urgent orders, for the bridges were repaired the same night.

Aside from this source of supplies, each regiment was authorized to have three wagons for tents and medical supplies. At

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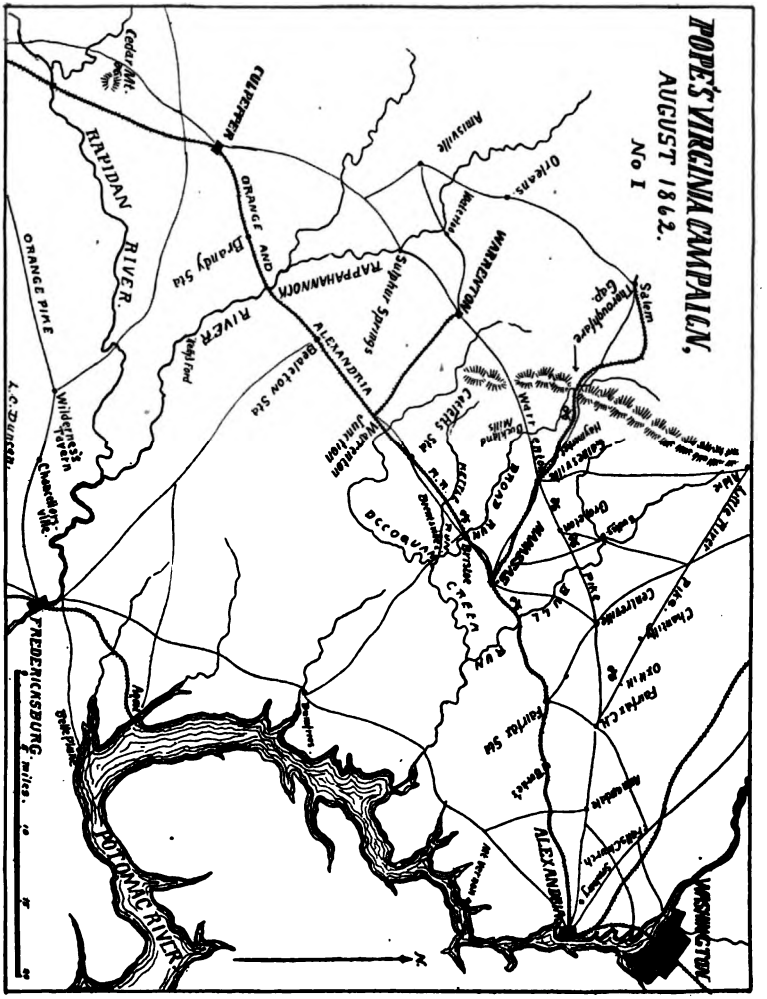
POPE'S VIRGINIA CAMPAIGN,
AUGUST 1862.
No I
RAPIDAN RIVER
RAPPAHANNOCK RIVER
ORANGE AND ALEXANDRIA R.R.
ORANGE PIKE
ALEXANDRIA
WASHINGTON
FREDERICKSBURG
POTOMAC RIVER
Culpeper
Warrenton
Warrenton Junction
Manassas
Bull Run
Centreville
Fairfax C.H.
Alexandria
Washington
Orleans
Salem
Thoroughfare Gap
Gainesville
Haymarket
Buckland Mills
Broad Run
Bristoe Station
Catlett's Sta
Bealton Sta
Brandy Sta
Sulphur Springs
Warrenton Junction
Wilderness Tavern
Chancellorsville
Falmouth Sta
Aquia Creek
Acquia Creek
Occoquan
Cedar Mt.
Culpeper
Rappahannock
Rapidan River
Orange and Alexandria R.R.
Orange Pike
Potomac River
Fredericksburg
Washington
Alexandria
Manassas
Bull Run
Centreville
Fairfax C.H.
Warrenton
Warrenton Junction
Sulphur Springs
Brandy Sta
Bealton Sta
Falmouth Sta
Chancellorsville
Wilderness Tavern
Occoquan
Broad Run
Bristoe Station
Catlett's Sta
Buckland Mills
Haymarket
Gainesville
Thoroughfare Gap
Salem
Orleans
Aquia Creek
Acquia Creek
Cedar Mt.
Culpeper

least that is the statement made by McParlin in his official report. He does not state that they actually had so many wagons and it is practicatly certain that they had not.

CEDAR MOUNTAIN.

On July 16th, McDowell's Corps was at Warrenton, Sigel and Banks at Sperryville, farther west. These corps had been cleared of sick and wounded before leaving their former stations and it was hoped that the regimental hospitals could care for the ordinary sick. But there appears to have been much sickness and it soon became necessary to have hospitals nearer than Alexandria. The two hundred tents were set up at Warrenton and churches and other buildings used in addition. By the last of July enough sick had been sent back to Alexandria to fill the hospitals there; so they were cleared out to make room for others yet to come. There were no wounded as yet. A tent hospital was also established at Falls Church about this time. McParlin complained of the number of vagrant soldiers, malingerers, and other skulkers that would congregate about the hospitals and endeavor to get to the rear; even before fighting began. McDowell's Corps of 23,000 had during July an average of about 1,100 constantly sick and sent 1,017 to the base hospital.

By August 8th, all the corps had moved forward to the vicinity of Culpepper. The hospital at Warrenton was broken up and the tents moved back to Alexandria; the supplies were brought forward to Culpepper. On the morning of the 9th General Banks' Corps left its camp and marched out seven miles to near Cedar Mountain (Slaughter Mountain). At four that afternoon, Banks rashly pushed his two divisions into a determined attack on Stonewall Jackson's entire corps. No engagement of the war was more fiercely contested. In this battle as in all the battles of this mourful campaign, the soldiers bravely did what they might to repair the mistakes of their leaders. Banks placed his men in a suicidal position and they were too brave to retreat; they stood until one-third their number were either killed or wounded. Finally after dark they were withdrawn across the run, leaving their very badly wounded behind.

This action did not begin until five and the wounded did not

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begin to come in until dark. Field hospitals were established for both divisions, in the wooded valley of Cedar Run. The First Division hospital received six hundred wounded by nine o'clock, dressed them without much operating, and sent them on to Culpepper by ambulances and on foot. This division had 1,007 wounded, probably more. The Second Division hospital treated about four hundrd; there were three hundred and thirty-nine reported wounded in this division. The ambulances of the division disappeared and the wounded came in on foot or were carried by their comrades. Colonel Donnelly, of the 28th New York, came in on a horse, wounded in the lower part of the abdomen; the ball lodged in the pelvis and supposed to have passed through the bladder. He was sent in to Culpepper and lived seven days. The wounded in this hospital were operated on before being sent to the rear. The night following the battle was one of brilliant moonlight, the surgeons set up their tables in the open air and worked until morning. Late in the night the air turned cold and they observed that it had a bad effect on the very gravely wounded, of whom there were many, the battle being fought almost hand to hand. All the surgeons commented on the number of wounds of the chest and abdomen.

The total loss in this battle was 314 killed, 1,445 wounded, and 622 missing. As the Confederates reported but 400 prisoners there is little doubt that the remaining 200 were either killed or wounded. The men of Banks Corps returned sadly to their camp where the many empty tents told the story of their useless sacrifice at Cedar Mountain.

During the next day (August 10th) the work in the field hospitals went on, but there were many still lying on the field, at the most advanced position, now occupied by the enemy. These sufferers were without help until Monday. Finally on the eleventh some surgeons, chaplains, and soldiers ventured forward without authority to try to do something for their comrades, now thirty-six hours without food or care. They were not halted but by some informal arrangement were allowed until two o'clock to gather up and remove the wounded, who were first paroled. By night all the wounded were back in Culpepper. Some of the surgeons met Jackson himself, who treated them well and placed no obstacle in their way, only reminding them that they should not take advantage of their

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opportunities for observation, and report what they saw within his lines. His army was then leaving its position.

There were few tents at Culpepper, so the wounded were placed temporarily in churches, hotels and other buildings, and McParlin applied to the Quartermaster for a train of cars to remove them to Alexandria. Next day (August 10th) he went to the front, expecting the battle to be renewed. The wounded being all recovered on the eleventh he returned to Culpeper, and found the surgeons there so busy with the work that they had forgotten the train that was waiting on the track. He placed Surgeon John H. Rauch in charge of the hospitals at Culpeper, now containing some 1,500 wounded, and began evacuating them to the rear.

The first train left on August 12th carrying 480 patients. Each train had medical attendants, water, subsistence, straw (on the floor of the cars) and necessary bedding. Thirty cases with recent amputations were carried over the 70 miles of poor track without mishap. These were not hospital trains, or even passenger trains, but returning box and stock cars bedded with straw. The conduct of these trains appears to have been so excellent throughout the campaign as to have exacted no criticism; an unusual thing in transportation of wounded.

A small relief station was established near the depot at Culpepper so that there should be no lack of care at the point of transfer. It was at such points as this that patients often lay for hours without care. All transportable cases were removed by August 18th. The Alexandria hospital reports show 891 patients received from Cedar Mountain, out of 1,445 reported wounded.

A temporary hospital, with the supply cars, was maintained until that date. Articles of supply, including ice, were brought from Alexandria as neded, but nothing permanent established, for despite Pope's proclamations the army expected to retreat. The management of the wounded at Cedar Mountain was excellent and elicited praise from the Surgeon General.

From the small skirmishes that took place from day to day the wounded all came back to Culpeper; but the regimental tents and supplies were with the regiments, several miles away.

The condition as to medical officers was the same; the

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the front. The three corps at this time consisted of about 90 regiments and had 273 medical officers; all attached to regiments and brigades except the nine medical directors of corps and divisions. This faulty arrangement showed clearly the need of division hospitals with separate personnel and equipment.

In Culpepper the following hospitals were in use at this time: Episcopal, Baptist, Methodist and Presbyterian churches; Piedmont, Virginia, and Depot hospitals, Masonic Hall, Tobacco factory and an encampment near the depot.

After the fight at Cedar Mountain medical officers had to be sent back from the front to serve what should have been the clearing hospitals at Culpeper, though a renewal of the contest was confidently expected. This fault also was due to the lack of organization in the rear.

McParlin says:

> The experience at Culpepper also caused me to add to the purveying depot of battlefield supplies a proper staff of good operating surgeons and executive men; quick to receive the wounded, to place them in trains, or direct them to remain at the depot hospital; other assistants informed how to procure subsistence, to have food for hundreds or thonsands cooked and served at once, others to superintend the forwarding of wounded in the proper manner—to accompany them if necessary—and especially to observe that none but proper cases were sent away.

This was in effect a clearing hospital for the whole army, the first clearly conceived one of the war. It was a day's march to the rear, at the head of rail transportation, was not intended to be permanent, and was to be moved by rail when necessary. McParlin was learning rapidly. His only great mistake was in organizing but one such hospital for the whole army. His outfit would have sufficed possibly for one corps. There were then three corps, and soon after six.

This hospital was continued throughout the campaign under charge of Surgeon Rauch. Later it was held nearer the battlefield and took on more of the character of a field hospital. The ambulance service at this time was directed by Surgeon Jackson of the 16th Pennsylvania. The ambulances ordinarily remained with their regiments, but were collected and used independently when necessary. This was very unsatisfactory.

McParlin says that soon after this date he received the Letter-

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man plan from the Surgeon General, but there was not sufficient time to put it in operation.

General Reno joined the army with two divisions from Burnside's Corps at Fredericksburg on August 14th. Reno brought 8,000 men which more than made up for the losses at Cedar Mountain and by sickness and other causes. Banks' Corps, however, was shortly after placed in charge of the army trains and took no part in the battles which decided the campaign.

When the work at Culpepper was finished the ambulances had been in use for a week; forage was scarce, the animals were becoming weak, while the brigade and regimental commanders were clamoring for their return. When away from their own commands the animals were often without feed, and the drivers without rations. As McParlin observed in his report, a separate ambulance corps would have obviated these difficulties.

EVENTS PRECEDING THE BATTLE.

On August 18th and 19th Pope withdrew to the eastern bank of the Rappahannock. Lee's whole army was approaching. The wounded and sick at Culpeper were all sent to Alexandria, except a few not fit for transportation. With them surgeons volunteered to remain, and supplies were left. The purveyor's stores were packed in six cars and sent on down the railway as far as Warrenton Junction (Calverton). The last train left Culpeper on the night of the 19th. The army now took up a position on the left bank of the Rappahannock and Bealeton Station was selected as the site for the hospitals and urgent supplies.

Everything was made ready for the battle that all expected here. At no other time during the campaign was the Medical Department so well prepared for battle. But it was not General Lee's purpose to attack. There was skirmishing at the fords resulting in some 250 wounded who were easily cared for and sent to the rear.

Taking counsel from his troubled experience in loading and unloading stores at Culpeper, McParlin had his cars of medical supplies run on a siding and issued what was needed directly from the cars.

This plan was so satisfactory that he telegraphed to Alexandria, directing that two cars be fitted up with shelving and fixtures convenient for issue; to be filled with the most necessary articles;

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such as: medicines, instruments, dressings, stimulants, anesthetics, prepared foods, blankets, water buckets, lanterns, etc. These cars were ready on the 23rd and were used until burned on the 31st. He also made a last attempt to get the ambulances, medicine wagons, animals and other things necessary to complete his equipment, but the trains were overcrowded and he failed.

On the 22nd a small cavalry force got in the rear and struck the railroad at Catletts Station, destroying, among other things, the headquarters' baggage. Even the surgeons' things were not spared. McParlin says with evident feeling:

> My office records were scattered, several valuable papers and maps lost, and my servant, horse and bedding had disappeared. * * * It may be conceived what sort of a life was led by us at the front.

They were destined to see worse things.

While on the line of the Rappahannock the Medical Director had an unusual amount of trouble with malingerers and skulkers, who thronged every hospital and tried to climb on every train going to the rear. The blame for this was usually put on Sigel's Dutchmen, but it probably existed in most corps. The 60th New York had a virulent outbreak of typhoid, hundreds being stricken in a short time. These men, with the malingerers, overran the hospital at Bealeton. On August 22nd Capt. Fifield, in charge of the Railway there, telegraphed McParlin:

> The enormous number of complaining and sneaking men who come in here claiming to be sick will take all the transportation of the road and nothing will be left for the wounded.

And Surgeon Rauch sent many similar telegrams, as: "With each supply train I see three or four men running away. A cavalry patrol should be ordered here to prevent and arrest them;" and, "I have just stopped a train of ambulances that was going to the rear. If I had the detail of men I would have arrested several drivers." And so on, many others of like tenor; showing a failure of discipline throughout the army. The lack of control of the ambulance drivers grew worse and worse as the campaign progressed.

From the time that Pope took the line of the Rappahannock the troops had no rest. There was a continual marching and counter-

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marching. Corps marched up the river one day and down again the next. The men were worn out by repeated and often unnecessary marches. Not only this, but the daily issue of new orders, often immediately followed by others countermanding them, showed a lack of continuity of purpose, the absence of central controlling ideas, that soon became apparent to the body of officers and even to the men. Though the army never failed to fight, and up to the best standards, it was gradually becoming exhausted and spiritless and steadily losing faith in its leaders.

To add to this weakness, rations became scarce and irregular, partly due to insufficient provision, partly due to complex marching; one fault reacting on and increasing others. There are still extant letters from officers complaining of the scarcity of food early in the campaign. Jackson's men could live on green apples and roasting ears, but our officers expected something better. When the railway was broken on August 26th and supplies had to be wagoned out, the condition was aggravated, and during the closing days of the campaign the exhaustion of actual hunger was added to that of fatigue and mental depression.

The Confederates doubtless marched as far and had as little to eat. But their marches had a definite (and simple) aim, that could be comprehended by the most ignorant soldier. As to short rations, they hardly expected anything else. And at the end of the campaign they too were exhausted. Jackson's invincible corps marched but nine miles on September 1st. The attack was not pushed with the accustomed vigor and was successfully resisted by smaller numbers.

On August 25th it was learned that Jackson was moving to the right, but where? The wounded and sick were sent back to Warrenton Junction and the whole army began to move back slowly. The Surgeon General anticipated a general engagement at this time and sent out a party of high ranking medical officers from Washington; but no battle took place and they returned on the 28th. Had they waited but a few days longer they would have seen enough of battle and wounded to satisfy any reasonable anticipation.

Such wounded as came in were cared for in tents at Warrenton Junction, where the purveyor's cars were with plentiful supplies. A temporary hospital had been established at Warrenton for the 60th New York and other troops in that neighborhood. This hos-

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pital was now broken up (Aug. 27th), the furniture and patients were loaded in cars and all sent to the Junction, preparatory to being sent on to Alexandria. The trains were loaded and the army moving on the 27th when, as McParlin says: "Extensive fires appeared eastward in our rear, and it was rumored that the railway was cut by the enemy." This rumor was well founded.

Jackson, leaving his trains behind, had made a remarkable march of fifty-two miles, passed through Thoroughfare Gap and on to Manassas without Pope's knowledge. The fires were consuming millions of dollars worth of rations and stores in warehouses and cars at Manassas. (Jackson's corps ambulance train at this time consisted of thirty wagons.)

Although Jackson held the railway there but 36 hours, he so effectually destroyed the bridges over Broad Run and Bull Run that no more trains got to the rear. The engineers, by hard work, finished Bull Run bridge on the 31st, it was burned again the same night.

All the trains were now cut off from Alexandria. On August 27th General Halleck sent out a brigade of New Jersey volunteers to open up the railway at Manassas. This force crossed Bull Run and had almost reached the Junction when it unexpectedly ran into Hill's Division and was almost annihilated. The survivors fled and did not stop till they reached Alexandria.

The severely wounded were doubtless left behind and fell into Jackson's hands. He, in turn, was obliged to leave the worst cases next day, but carried the slightly wounded on to Sudley Ford where most of his prisoners were paroled. Banks' Corps reached Manassas on the 28th and picked up all the wounded and sick there, including some Confederates.

In the march on the 27th Hooker's Division (Heintzleman's Corps) had the advance along the railway. These troops had been hurried out from Alexandria a few days before. Many of the field and staff officers were on foot, their horses not having left Yorktown. It was observed on this march that there was not the usual strife with stragglers, and it was claimed that those mounted officers who had maintained that riding caused greater fatigue than walking, and had heretofore been most exacting with the foot-men, were now the first to fall out from exhaustion.

Hooker had a fight with Ewell's Division which maintained a delaying rear guard action west of Bristoe. The losses amounted

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to 250. Medical Director Milhau established a field hospital at Kettle Run. This division had almost no trains or supplies but had an Autenreith medicine wagon and a few ambulances with headquarters. Next morning a hospital was established at Bristoe. The purveyor's cars reached Kettle Run that day and stores were plentiful.

Just previous to Jackson's raid Heintzleman's and Porter's Corps had marched out from Alexandria and joined the army near Warrenton, Heintzleman on the 24th, Porter on the 26th. Reynolds, with the Division of Pennsylvania Reserves, had joined McDowell on the 23rd. The army now numbered close to 70,000 men.

On the 27th the various corps had reached the vicinity of Gainesville and points farther south as far as Bristoe, with the rear extending back to Warrenton. On the 28th all moved on toward Centreville, by the Warrenton Pike, the Railway and intervening roads. On this day Banks' corps was moved along the railway to guard the wagon trains of all the corps, which had flocked in to Warrenton Junction. Thenceforth this corps guarded trains and took no part in the battles. When the corps moved eastward on this morning McDowell knew that Lee was approaching Thoroughfare Gap with the balance of his army. So he left Ricketts' Division to guard the Gap. Ricketts engaged the enemy and detained him for three hours, but was forced to retire. Surgeon N. R. Mosely, U. S. Volunteers, was medical director of this division. He established a hospital in a large frame house about a mile in the rear, bringing the wounded, thirty-nine in number, to that point in ambulances. After the battle they were loaded in an ambulance train and started toward the railway at Manassas under charge of Brigade Surgeon J. T. Heard, afterwards medical director of the First Army Corps. This was on Thursday afternoon.

On Sunday Surgeon Mosely was at the general field hospital on Bull Run. He says:

> I found here Dr. Heard, who had left Gainesville with wounded, in ambulances on the 28th. He had been unable to reach Manassas, but the wounded had been faithfully cared for by him, notwithstnding they had been on the road for three days and a half.

That Surgeon Heard was able to bring his ambulance train through this broken country, filled with marching troops, and

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everywhere fought over, is not less than remarkable One wonders how he fed them and what the division did for ambulances during this time.

On the morning of the 28th Jackson left Manassas, marching around by Bull Run, one division by Centreville, then west on the Pike, to take up a position on a stony ridge running from Sudley Ford to a point a little west of Groveton. Here he remained throughout the battles that followed. An old railway grade along his front made excellent cover. Very late that afternoon, while the Union divisions were marching eastward on a fool's errand to Centreville, King's Division (McDowell's Corps) came marching down the Warrenton Pike from Gainesville, past Jackson, and all unconscious of his presence. It was sunset when the last brigade left the town. The weary men were plodding along and had almost reached Groveton when suddenly shells began exploding in the midst of the column.

Poorer troops would have bolted, these were of the Iron Brigade, now under General Gibbon. They were promptly faced to the left and aided by two other regiments advanced towards the woods. Five brigades of Ewell's and Taliaferro's Divisions marched out to meet them. The lines halted within seventy-five yards of each other and fired into each other's faces until the darkness of an unusually black night ended the useless slaughter.

The old Stonewall Brigade had met the Wisconsin Iron Brigade and on no field of the war was there a more stubborn or murderous combat. "Within the Federal lines the dead and wounded lay in pairs and heaps, a ghastly sight on the green turf beneath the trees, or near a pathway leading from the field, where in the darkness of the night many of the wounded had dragged their fainting bodies. When the surgeons gathered in the wounded, bits of candles and burning torches shed through the gloomy forest a gloomier light." Of the six regiments nearly one-half lay dead or wounded on the field.

On the other side there was evidence that the Stonewall Brigade had at last met men worthy of its steel.

Ewell lay out in front of the railway embankment, helpless and bleeding, with a ball through the knee. Taliaferro was wounded. Colonel Botts of the 2nd Virginia and Colonel Neff of the 33rd were dead. The Colonel of the 27th and the Majors of the 2nd and 4th were wounded. The losses in the other brigades were ap-

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palling. These were in Taliaferro's Division. The two brigades of Ewell's Division had 219 killed and 539 wounded. The Union loss, including missing, was about 850. Gibbons' Brigade had 133 killed and 539 wounded. The division commander, King, was not wounded, but next day had to give up the command from exhaustion and sickness.

When the firing ceased the wounded were gathered up and the brigade withdrawn to the road where the men lay down to sleep with arms in their hands while the generals debated as to what to do. They decided to leave the Pike and continue the march by way of Manassas.

All wounded that could bear transportation were loaded in ambulances; there could have been little dressing in the darkness that night. The gravely wounded were left on the ground, in charge of surgeons, the report says. Many lay where they fell, in charge of no one. Fortunately in the battle of the next day the advance of Reynolds' Division reached the scene of Gibbons' battle north of the Pike, and the hospital south. The wounded who had remained on the field uncared for during the night, and through the conflict of the day, were recovered.

It is interesting to note the fatigue, exposure, and deprivation to which men were subjected in this campaign.

The men of King's Division had marched from early morning on the 28th and went into battle instead of camp at dark. After the conflict described above they had a little rest, but at one they marched again, reaching Manassas at six next morning. Here they had a little food, but before they could butcher the beeves that were to feed them the order to march came again.

They reached the battlefield in the afternoon and at six were rushed forward at double time for a long distance, and into an assault even more fruitless and suicidal than the one of the evening before. The division made this attack alone, and only darkness saved what was left of them from death or capture. The men had neither dinner nor supper this day, and it is said they asked for none, but silently rolled themselves in their blankets at night.

Few, if any, of the troops had rations that evening. On the afternoon of the 30th King's Division was put in alongside Porter's Corps in an attack against the railway embankment. The assault was as obstinate as any of the war, but all in vain. Hatch,

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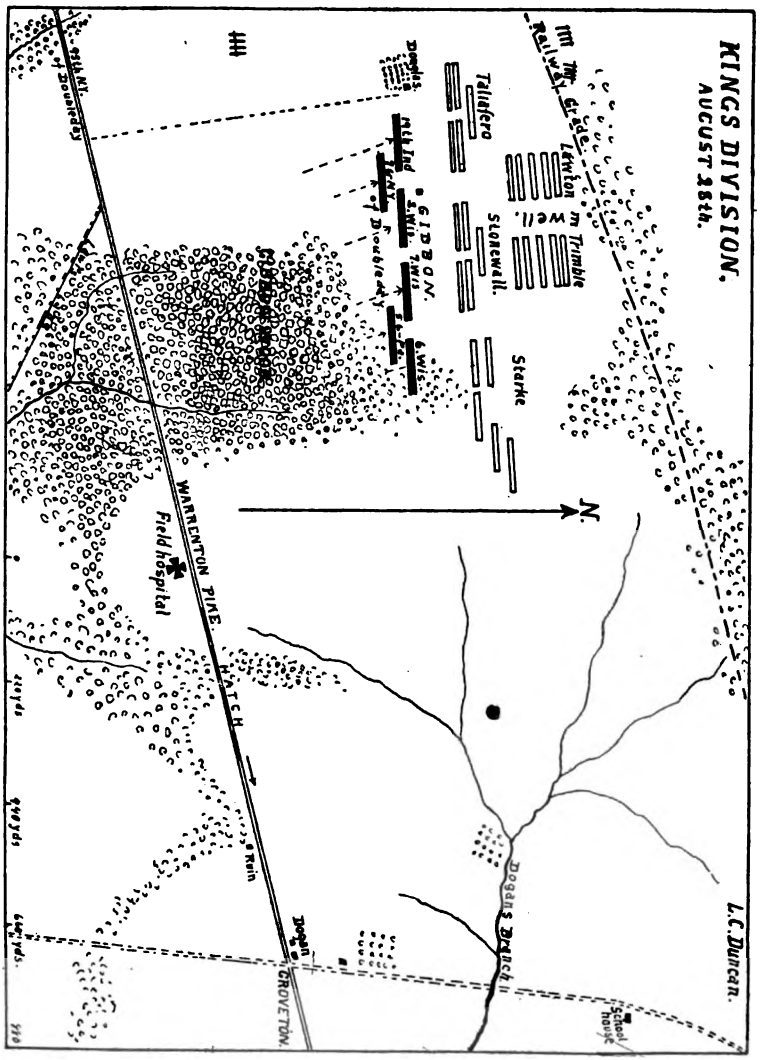

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now in command, was wounded; and the lines fell back. McDowell says that Gibbons' Brigade (the Iron Brigade) remained on the Henry House Hill that night until the whole army had crossed Bull Run, then burned the bridge and retired on Centreville, which it could not have reached until long after midnight. The division lost 892 men in the three days.

After King's fight near Groveton the division retired to Manassas and Ricketts followed him there. By the morning of the 29th the whole army was at Manassas and points farther east.

Banks, Porter and McDowell were near Manassas, Heintzleman, Reno and Sigel near Bull Run. Pope was at Centreville.

Jackson sat tight and Longstreet was about to join hands with him.

The Confederate corps were ready to unite. The Union army could only claim to be between it and Washington.

Banks' Corps was near Bristoe with the trains. When the medical supply cars were halted there McParlin had three-fourths of the stores taken from the cars and placed in some wagons of Sigel's Corps that were passing. Sigel always clung to his wagons. It was said that Napoleon put his trust in heavy battalions, Sigel in long wagon trains.

Medical Director Rauch with the operating surgeons, cooking department and stores was sent on to Manassas. The remainder of the stores were left for Banks' Corps.

When it came up Medical Director Antisell collected 480 sick and wounded and placed them in cars, expecting the bridges to be restored so he could send them on to Alexandria.

McParlin often found it difficult to secure rations for the sick and wounded; commissary officers refusing to issue rations except to their own special commands. To remedy this fault he secured the following order:

HEADQUARTERS ARMY OF VIRGINIA,
August 29, 1862.

To the various commissaries of Volunteers of the Army of Virginia:

You will each of you issue rations to hospitals in the field on surgeon's requisitions or returns, no matter to what brigade, corps, or command either commissary or surgeon may belong.

By order of Major General Pope:

E. G. BECKWITH,
Chief Commissary of Subsistence.

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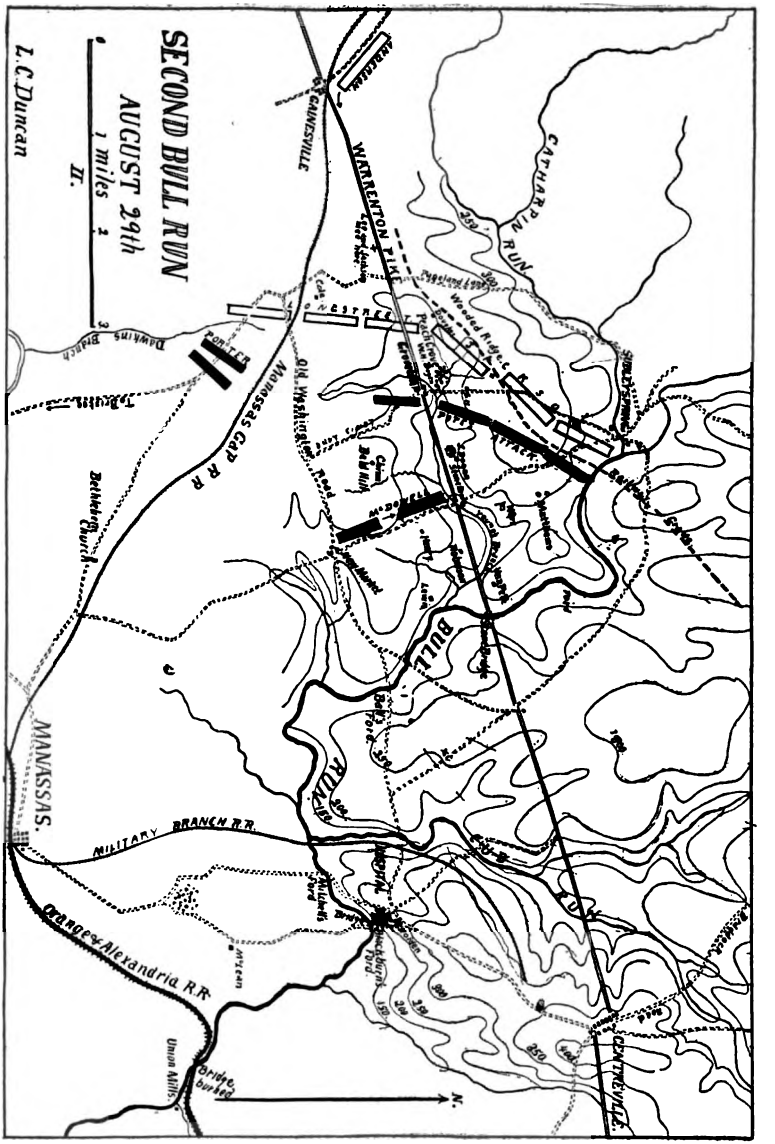
SECOND BULL RUN
AUGUST 29th
1 miles
II.
L.C.Duncan
GROVETON
CATHARPIN RUN
WARRENTON PIKE
Groveton
Deserted Battery
Dawkins Branch
Stone House
Manassas Gap R.R.
Old Warrenton Road
Bethlehem Church
Chinn House
Sudley Church
Sudley Ford
Sudley Road
Battery
Stone Bridge
Bull Run
Run
BULL
MANASSAS.
MILITARY BRANCH R.R.
Orange & Alexandria R.R.
Union Mills
Bridge burned
N.
CENTREVILLE

FIRST DAY'S BATTLE.

On the morning of the 29th Pope prepared to move with all his corps (except Banks') and attack Jackson, who still lay on his rocky ridge behind the old railway grade. Banks remained at Bristoe guarding the railway trains and the wagon trains of the whole army. The other corps, heretofore moving eastward, were to turn back and converge on Groveton. They were directed to march around by Centreville, then turn west on the Pike, and attack the enemy when they met him. This useless circuit delayed the battle until noon. Reno advanced near Sudley Springs, Heintzleman north of the Pike and Sigel south. Porter and McDowell were farther south toward Manassas; McDowell marched north on the Sudley Road but did not reach the field until near night. Porter remained out of the fight the entire day. So of the six corps but three were engaged. Jackson, on the other hand, had been joined by Lee before noon, though not actually aided in the fight by more than two divisions. The fighting was severe and on the right some ground was gained. In the center there were some desperate charges against the railway embankment, but nothing was actually accomplished except useless slaughter. Jackson's troops were fairly well sheltered and Pope was allowed to shatter his corps against them. The loss in killed and wounded was about 4,000.

Early on the morning of the 29th McParlin selected the site for his main field hospital. He says:

> Reconnoissance showed that the bridge (R. R.) towards Fairfax Station was burned. I had to locate the depot near the bridge or ford north of Bull Run (Mitchell's Ford) which was on the road from Manassas to Centreville, and near the main body of the army. At the same time it was accessible by a branch from Centreville to Manassas Junction. Should we remain there long enough to have the bridge repaired (R. R. bridge over Bull Run) we could afterwards transport supplies and wounded by the railroad.

Manassas had been the headquarters, now at Centreville, and Pope had plainly intimated that he contemplated moving the whole army to Centreville. Unfortunately he did not do so soon enough. So the hospital was naturally located at the ford on the road between the two places. Yet the battle was expected to take place near Groveton or Gainesville and the Warrenton Pike led

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directly from Gainesville through Groveton to Centreville, almost in an air line. It seems that the eastern bank at the Stone Bridge would have been a better location for the great field hospital in the battle that was to come. It involved transportation for a shorter distance, over a better road.

It is true that the ford is nearer the railway, but there is no good road from there to the railway, east of Bull Run, except by Centreville to Fairfax Station. The branch line offered some prospective advantages, but they were contingent on Pope's success, which neither his past achievements nor his present actions gave promise of.

McParlin goes on to say:

"Inspector Vollum, Medical Director Rauch, and the purveying depot took position immediately at the bridge, occupying a building near the river, which had a well of water in the yard. There were no supplies destroyed or left at Kettle Run, all being brought forward to the depot by Dr. Rauch, or used there by Medical Director Antisell. While General Banks remained at Bristoe (until Aug. 31st) any supplies needed were drawn from the cars by wagons.

Surgeon Antisell, however, says:

When the corps left Bristoe Station the train of cars left behind with quartermaster and other stores, one with purveyor's property, were set on fire.

Banks burned five locomotives, one hundred and forty-seven cars, and part of his trains, by Pope's orders. Most of these cars had been emptied.

McParlin formed his general hospital early and the battle did not begin until near two o'clock. He says:

After these dispositions were made, on the 29th, I joined headquarters in front, passing through Centreville and along the Warrenton Pike, beyond Bull Run. * * * The engagement was kept up actively. Wounded were brought in from the front and received the attention of the brigade and corps medical officers that night. The view from the Headquarters (Buck's Hill, north of the Stone House) embraced a most extended country, filled with troops, the lines of camp fires stretching for miles away towards Thoroughfare Gap. It was confidently expected at Headquarters that the enemy, if vigorously assailed before reinforcements arrived, would be cut to pieces or captured.

But the assailing was piecemeal and reinforcements arrived before noon. Lee's whole army was now up.

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The wounded from the day's action were numerous. I informed the Surgeon General of our condition and prospects, requesting surgeons, battlefield supplies, and ambulances to be sent from Washington; this by courier to the nearest railway station.

When darkness fell the gathering up of the wounded from between the lines began. The Federal troops had made a number of determined attacks, reaching positions which, from lack of support, they were compelled to abandon. These assaults left many wounded up close to the opposing lines. Warren Lee Goss, in his *Recollections of a Private,* says:

At the end of the first day's battle, August 29th, so soon as the fighting ceased many sought without orders to rescue their comrades lying wounded between the opposing lines. There seemed to be an understanding between the men of both armies that such parties were not to be disturbed in their mission of mercy. After the failure of the attempts of Grover and Kearney to carry the railroad embankment the Confederates followed their troops back and formed a line in the edge of the woods. When the firing had died away along the darkling woods little groups of men from the Union lines went stealthily about, bringing in the wounded from the exposed positions. Blankets attached to poles and muskets often served as stretchers to bear the wounded to the ambulances and surgeons. There was a great lack of organized effort to care for our wounded. Vehicles of various kinds were pressed into service. The removal went on during the entire night, and tired soldiers were roused from their slumbers by the plaintive cries of comrades passing in the comfortless vehicles.

The first day ended gloomily; thousands had been lost to no advantage; the men were exhausted, rations scarce, and confidence being gradually lost. Pope telegraphed that night that he had lost 8,000 and the enemy twice as many, that Ewell was killed, Jackson wounded, etc.

McParlin goes on to say:

As the turnpike to Centreville was very rough, several bridges destroyed, and our general depot was near the bridge (Mitchell's Ford), I instituted a search and found a short road running from the Centreville (Warrenton) turnpike, near the battlefield, directly to the general depot. I sent circulars to the corps directors, informing them where the wounded should be sent, and stationed some mounted men on the Pike, to direct the ambulances and wounded properly.

It appears clear from this statement that McParlin had no map of the region, and no idea of its geography except what he grad-

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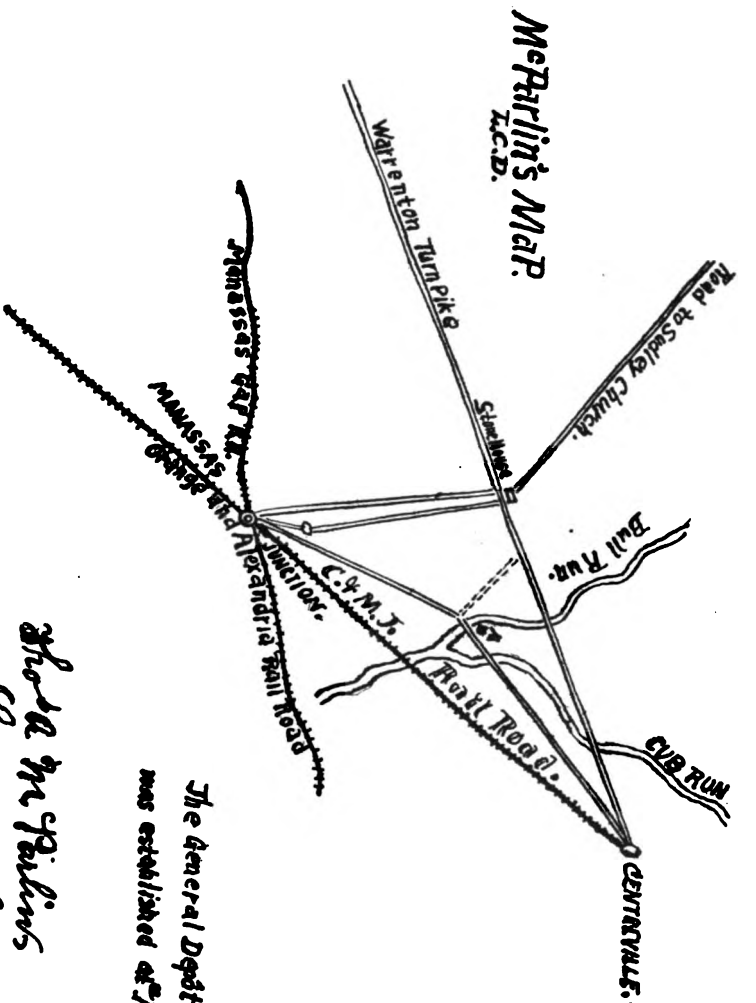

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ually obtained by experience. It is difficult to believe that the wounded were moved by the Pike nearly to Centreville, and then back to the ford, but that is what was done, until he found his shorter road. Pope, in his order for the battle, had directed the corps from Manassas and the Fords to march by Centreville to attack the enemy near Groveton. They were all in need of a course of map study.

The road that McParlin found appears to have been a by-road leading by the Robinson House, as shown in his map.

The distance back to the hospital was so great that the ambulances could make but few trips, even if the wounded could be reached.

McParlin's sketch map, submitted with his report, may be compared with a correct map of the field, to determine how accurate his mental picture of the ground was.

His map places the hospital at Island Ford, but his own statement and all the other accounts locate it at the Holden House, near Mitchell's Ford.

(*To be concluded in January Number.*)

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HOW MAY WE DETERMINE THE POTABILITY OF WATER IN TEMPORARY CAMPS, MARCHES AND MANEUVERS?*

By Major ROBERT S. McCAUGHEY, Medical Corps, N. G. Illinois.

THIS question, I believe, has not received the attention in this country that its great importance demands. Good sanitary water is just as important for the health of the army as good, clean food. The amount of water-borne disease in the past has been appallingly high. How may such disease be reduced to a minimum in the future? The subject of sanitation has been a part of the curriculum of our leading schools for only the past few years, and even here it has received only quite general consideration. The result is, that we have many officers in the Medical Corps of the National Guard who are unable to render the most efficient service in this important subject of potable water. I am quite sure that most of us have at some time or other felt our helplessness in this matter. Our officers are supplied with Field Service Regulations, Manual of the Medical Corps, Infantry Drill Regulations, Outlines of First Aid for the Hospital Corps, etc., all of which are more or less necessary, but the sanitary officer needs, in addition, at least a manual which considers the character of water, its examination, and the interpretation of the results. After study of such a manual, how profitable it would be for the officers, together with an instructor, to take the field, inspect the various sources of water, collect specimens, make analyses, and record their findings and their judgment.

A correct judgment as to the potability of water cannot always be made from a chemical examination alone. A correct judgment cannot always be made from a bacterial examination alone, or from a physical examination, or even from a combination of chemical, physical and bacteriological. Thinking in percentage here is as important as everywhere else. Chemists have announced that certain waters are admirably adapted for all

*Read at the 21st Annual Meeting.

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domestic purposes, and water-borne epidemics have immediately followed. The same errors have obtained following bacteriological examination by trained experts. It is not necessarily the number of bacteria, a count of which may be decidedly low, but it is the virulence of the bacteria. While bacteriological examination is useful, especially as to efficiency of filtration, it is certainly impractical for determining potability of water while in temporary camps, marches and maneuvers. No one expects to find the specific organism in the water. Bacteriological examination serves only as an indicator of the degree of pollution by organic matter. By chemical and physical examination we can arrive at the same results in a much shorter time. By physical examination, we do not mean alone the physical properties of the water as appearance, odor, taste, smell and color, but what is most important of all, the examination of the source of supply, and its surroundings; the possibility, and liability to contamination. The physical conditions will frequently obviate the necessity of a chemical examination. It would seldom be necessary to examine river water, since our rivers are practically all polluted, at least at times polluted, which renders it unsafe to use the water at any time without proper treatment. The recommendation of such waters, after chemical examination, is the very source of distrust of such analyses This physical examination, and the interpretation of the results of analysis, are generally agreed to be the work of an expert. Now while it is not very likely that all sanitary officers, with the training that they will receive, will become expert in a high sense of the word, their judgment can be made practically safe. In every case of doubt, or even suspicion, the partly trained officer should condemn the water, although an expert might pass favorably on it and permit its use. The only difference would be, that water would have to be more frequently abandoned, filtered, pasteurized or sterilized than would be the case if an expert were at the helm.

This inquiry, then, into the source of supply of the water, and its liability to contamination, is the more important part of the answer to the question, "How May We Determine the Potability of Water in Temporary Camps, Marches and Maneuvers?"

Now as to the chemical examination; the technique of water analysis is quite simple. The difficulty as to its practicability in the past has been the handling of the necessary solutions. This

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has been overcome quite satisfactorily by Thresh of England, who uses the necessary chemicals in the form of tablets; each tablet being quantitatively correct. The outfit of Thresh, with which some of you are doubtless more or less familiar, is supplied in convenient form for use in the field by Burroughs, Wellcome & Co. It has been used in the English Army and by sanitary officers in England for the past few years and this year (1912) was adopted by the British Admiralty, which is a further recommendation of its practicability. By the use of the tablets and this outfit we can easily do an analysis, at any place, within two hours.

Thresh, in his work, "A Simple Method of Water Analysis," published in 1912, states that he has controlled 24 examinations, done by the rapid method, with results, obtained by most exact work. There was no essential difference, and the judgment was not disturbed in any case.

The method described by Fromont, in the Archives de Médecine et de Pharmacie Militaires, October, 1911, in an article entitled "Rapid Analysis of Water in Campaigns," is also one which can be performed in about two hours. The necessary apparatus occupies somewhat more space, but its bulk is certainly not objectionable. Some of the methods recommended by Fromont are certainly more exact, without, in some instances at least, greatly prolonging the time of analysis.

The outfit described by Fromont is more complete than that of Thresh. Fromont includes a block tin condenser and a distilling flask of 125 c. c. capacity.

Fromont's reagents are contained in glass ampules in proper quantity.

The following points are to be determined:

1. Color in 6-inch column.
   Turbidity.
2. Odor.
3. Reaction.
4. Residue on evaporation.
5. Free ammonia.
6. Chlorine.
   Equivalent of common salt.
7. Nitrites.
8. Nitrates.
9. Hardness.

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10. Lead, zinc, iron and copper.
11. Oxygen absorbed.

Fromont's method considers the following:

Concerning organic animal matter contamination:

1. Titration by permanganate in alkaline medium.
2. The amount of albumenoid ammonia.
3. Determination of nitrites.
4. Determination of phosphates.

Concerning organic vegetable matter contamination:

1. Titration by permanganate in acid medium.
2. Determination of free ammonia.
3. Determination of nitrates.

The chief differences as to the modifications of the details of technique will be considered under the various subjects.

Thresh does not consider it essential to consider phosphate or albumenoid ammonia as does Fromont. The latter, in addition to oxidation of organic matter in acid medium, estimates amount of oxygen required in alkaline medium.

A one liter sample is sufficient, but a Winchester quart jar, which holds about 2,400 c. c., is most desirable. They are made of blue glass, and have accurately fitting glass stoppers. Before the bottle is filled with the water sample, it should be rinsed out two or three times with the water. When the water is collected from a river or spring, the bottle is totally immersed in the water, and is then filled to within half an inch of the bottom of the stopper. If the water is supplied from a pump, or tap, several gallons should be allowed to flow away before the sample is taken. A sample of a town supply must be drawn direct from the street mains and not from a storage cistern. The stopper is inserted as soon as the bottle is filled.

Ammonia and organic matter should be determined as soon as possible after sample is collected, and immediately after the bottle has been opened. Before any portion is poured off for analysis, the bottle should be shaken to insure uniformity of composition.

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THE ANALYSIS.

Color is determined by filling a 100 c. c. Nessler tube and placing same on a sheet of white paper. The tube is made of white glass, and the paper must contain no tint of yellow. The examiner looks vertically through the column of water and notes the color. A duplicate tube, filled with pure water, may serve as a standard of comparison.

Pure water is colorless, or may have a slight bluish tinge. A yellowish, yellow green, or yellow brown tint, is due to sewage contamination, or to vegetable matter; the source and possibility of contamination, and the remaining analysis will usually determine. We must remember that polluted water may be absolutely colorless.

The degree of turbidity is also quickly noted at the same time with color.

Pure water is clear, but clear water is not necessarily pure. Turbidity, whatever its cause, whether due to organic or mineral matter in suspension, should be determined by microscopic examination. The procedure of Gerard of Brussels (quoted by Havard, *Military Hygiene,* page 132) may be simplified, it seems to me, by use of an ordinary hand centrifuge.

Evidences of contamination by man and animals may then be quickly found. The water is permitted to stand in a cylinder for an hour, while the chemical examination is under way, then the clear supernatent water is carefully decanted, leaving the lower 15 c. c., which is now transferred to a Purdy tube and centrifugated. A microscopic preparation is now made in the usual way. Hair, fibers of wool, silk, muscular tissue, vegetable cells, etc., are indicative of sewage.

For a standard of comparison, silica, suspended in water, may be used. While a water may be turbid from inorganic particles, or clay, and perfectly harmless, it is always less attractive for drinking purposes than a clear water.

Opalescence, although faint, is frequently found in polluted water. If surroundings render it suspicious that the turbidity is due to action of the water on lead, the proper test should be made. Filtering, for purposes of examinations, as a rule, is not necessary. If sample is more turbid than comparison standard, then the chemical examination will usually or frequently be inter-

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rupted, since already it is condemned as non-potable. This, of course, will depend considerably upon the cause of the turbidity. If desirable to continue the examination, the water is filtered, or a specimen is chosen, which has been made clear by subsidence, if this is possible. The first portion of filtrate is rejected.

The next portion is used to determine chloride, nitrate or metal (if necessary). The last portion is used for determining ammonia and dissolved organic matter. One must thoroughly wash filter paper free of ammonia. Test last washings with 2 c. c. of Nessler's solution, let stand five minutes, if water remains colorless paper is satisfactory.

Odor—Is determined by gently warming 100 c. c. of the water in an Ehrlenmeyer flask, then cork tightly and shake vigorously. Quickly remove cork and note any odor which may be apparent, then taste and note results. Pure water is odorless and tasteless, as a general rule.

Reaction—Is determined by adding a drop or two of Lacmoid. An acid water will be tinted red; if neutral or alkaline it will be blue. Neutral litmus paper may be used as indicator. The normal alkaline reaction of pure natural water is sufficient to turn it distinctly blue.

An acid reaction usually indicates the presence in water of manufacturer's waste or of mine products. Acid reacting water will act upon metals, lead, iron, zinc. Rain waters and peaty waters are acid.

Residue on Evaporation—Partially fill evaporating dish (made of nickle) with the water, and evaporate over spirit lamp. Note relative amount of residue, then heat more strongly, and observe to what extent charring occurs. It is best to use the same quantity of water each time, so that one will become accustomed in gauging the relative amounts of residue.

Good water, when evaporated to dryness, leaves only a small amount of perfectly white residue, which undergoes no further change on ignition. In the presence of organic matter the residue may have a brown tint, and will char when ignited and may give off a bad odor. Such a change is a strong indication of impurity.

Exceptions—If nitrates are in excess, no charring may occur, although organic matter is present in excess. Peaty waters give a residue which chars.

Free Ammonia—Qualitative determination—2 c. c. of Nessler's

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solution are added to 100 c. c. of the water. Note if a yellow tint is produced and the depth of shade. Note whether faint, distinct, or very distinct.

Quantitative Test.—Thresh has modified the usual distillation method. A water analysis outfit for our purpose should include a few distillation flasks, inclosed in a strong protecting case, a block tin condenser, and a rubber tube for syphoning water.

This necessary part of the equipment, for field work, is lacking in the Burroughs & Wellcome outfit.

The method as applied by Thresh is as follows: Place 100 c. c. H_2O in a flask, capable of holding about 200 c. c., connect with the condensing tube, and distill over 20 c. c. To this, when quite cold, add 0.5 c. c. of Nessler's solution. A yellow tint will be produced, varying in depth with the amount of ammonia present. Into 50 c. c of pure distilled water, put a tablet of ammonium chloride containing 0.05 milligram of ammonia, dissolve and add 2 c. c. of Nessler's solution. The liquid will assume a brownish yellow color, and each c. c. will correspond to 0.001 milligram of ammonia. Into a graduated 20 c. c. tube, pour in this solution until on looking through this and the water distillate, both have the same depth of color.

Read off the number of c. c. required to give the same depth of color. Each c. c., representing 0.001 milligram of ammonia, the amount in the water is easily ascertained. For example, the distillate from a sample of water gave a color corresponding to 6 c. c. of the standard. The distillate (which contains all the ammonia in the 100 c. c. of water) contained 0.006 milligram of ammonia. This represents 0.006 part per 100,000.

If the water was acid, of course the NH_3 would not be freed until it was rendered alkaline. A small fragment of carbonate of soda, free of traces of NH_3, is used. Ammonia and ammonium salts, present in water, in quantities sufficient to be demonstrated by this test, are almost always a sign of sewage contamination. The steps of oxidation of nitrogenous animal refuse are ammonia, nitrites and nitrates. In the presence of calcium, or magnesium carbonates, NH_3 is readily oxidized to nitrite and nitrate; hence its amount is reduced, by keeping the water, and it should therefore be estimated as soon as possible after the water has been collected.

Spring water and good lake water contain 0.3 part per liter,

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surface water from .02 part to 0.3 part per liter or even higher. Surface wells may show a higher content. A high proportion of NH_3, in a deep well, is suspicious, if there are no metals contained in the water to act as reducing agents, or if any appreciable amount of oxygen is required, in the permanganate test. (Clowes and Coleman, page 326.)

"If the ammonia has been carefully estimated by Nesslerization, it will be found that the purest waters yield a distillate which is either free from ammonia or contains so little that the color in the 20 c. c. tube, when viewed transversely, is barely perceptible, and when viewed vertically, does not correspond to more than 5 c. c. of the standard solution.

"If it requires 10 c. c. of this solution, suspicions of the purity of the water are raised, unless some cause, other than sewage pollution, can be discovered."—Thresh.

Frequently, only the qualitative test need be applied. If a quantitative test is necessary, it does not take long to boil 100 c. c. of water and distill over 20 c. c. so that the whole process should be completed in from 30 to 40 minutes.

This quantitative determination of ammonia by distillation, when a necessary part of the analysis, is the most time consuming of the whole procedure.

The concentration of ammonia and its salts in the water is so small that the formol titration of Ronchèse-Malfatti (quoted by Marcovici Zur Beurteilung der Acidose, etc., Wiener Klin. *Wochenschrift,* 1910, page 1078), which is both simple and accurate for determining ammonia quantitatively in the urine, cannot be applied, unless a given volume of water be very much concentrated. I hoped to try this out more thoroughly. It may be that by titration of a considerable amount of water, and the use of a very dilute NaOH solution it may be done. If this method can be made applicable, it will simplify the analysis very much.

Chlorides—Determination: Measure 100 c. c. of the water into a glass cylinder, add a tablet of potassium chromate as indicator, then add a tablet of silver nitrate, dissolve, and mix thoroughly. If no red color is produced, add another tablet of silver nitrate, and so on, until the liquid remains red when well mixed. The production of the permanent red color indicates the end of the reaction. Each silver nitrate tablet corresponds to two parts of chlorine per 100,000 or 20 Mg. per liter. Thus, if three silver

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nitrate tablets are required to produce the red color, the water contains about six centigrammes of chlorine per liter. If the $AgNo_3$ tablet produces no red tint, but the fourth gave a red color before the whole tablet was dissolved, then the water contains more than six parts, and less than eight parts, of chlorine per 100,000, and seven parts would be the correct amount to record. As the chlorine almost invariably occurs as sodium chloride, the amount of the latter can be calculated by dividing by 0.6. Then, seven parts of chlorine would correspond to 11½ parts of NaCl.

This test could be as quickly and more accurately made by employing a standard solution of $AgNo_3$—2.3944 Gm. of pure recrystallized $AgNo_3$ to a liter of water. Now, if 50 c. c. of water are titrated, 1 c. c. of the silver nitrate solution will represent one part of chlorine per 100,000 of the water. The standard $AgNo_3$ solution could be carried in ampules of colored glass, and delivered by a standard dropper pipette, to obviate the use of the burette.

Either method could be carried out in less than 5 minutes. As to the normal limits of the chlorine content of water there is considerable difference of opinion, as it differs for different sources of water and their location, etc.

The suggested limits of chlorine for water sources in Illinois, expressed in parts per million, are:

Lake Michigan, 4.5.

Streams, 6.

Springs and shallow wells, 15.

Deep drift wells, 15.

Deep rock wells, 5.—100.

The amount of chlorine in a pure water is quite constant for a locality. If this quantity is known, then an increase of chloride would be indicative of contamination.

Thresh states (edition 1912, page 21): "If the water contains a large quantity of nitrates, and at the same time contains organic matter, as indicated by the charring of the ignited residue, and the oxygen consumed, the pollution is recent, and especially dangerous."

If chlorides then rise above 1.5 to 2 centigrams per liter, we must inquire into its source. The origin of the excess of chlorides for a locality is urinary contamination. If, after a determination

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of chlorides, which have been suspiciously high, a determination of phosphates is undertaken, and these should also be high, we would have, at least on theoretical grounds, a confirmation of our suspicions.

Fromont considers it advisable as a general routine to make a determination of:

Phosphates—Determination: Gerard and Bohnn method. By this method the water does not have to be concentrated. In a 50 c. c. cylinder pour 25 c. c. water, add 1 ampule of 1 c. c. of pure HNO_3, 1 ampule containing 1 c. c. of Molibdic reagent, boil for 15 minutes.

If water contains phosphates, there develops in the water a yellowish color, more or less pronounced, or there appears on the side of the containing vessel, a light yellow precipitate.

A positive test for phosphates is a sign of contamination by urine, according to Fromont.

Nitrites—The shortest method takes 15 to 20 minutes. 100 c. c. of water in a cylinder is first treated with sodium acid sulphate to make an acid solution of Metaphenylenediamine sulphate. a tablet of which containing the proper amount is next added (.01 Gm.) If a brown color develops within 15 minutes. note whether pale, distinct, bright, or deep orange brown. The different relative depths of color are usually sufficient. If no coloration develops within 15 minutes, nitrites are absent.

The Germans employ the Trumsdorff Method. It a test tube place 20 c. c. H_2O, an ampule of 1 c. c. of Trumsdorff's reagent and 1 ampule of 50% H_2SO_4 solution. Place test tube in a box so that light does not influence the reaction. At the end of a half hour we will examine the tube. If a definite blue color has developed, the water contains nitrites, and is not potable.

If the total quantity of nitrites is desired, a comparison standard, made from standard solution of sodium nitrite, may be employed, or we may titrate the iodine freed by 1-100 N. sodium hyposulphite by aid of the standard dropper.

One drop corresponds to .0000005 Gm. of trivalent nitrogen. Quite accurate determination may be made by employing the method of Thiémann and Preuss.

Nitrites, if present in any appreciable quantity, should be regarded as an indication of comparatively recent sewage contamination.

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In themselves, both nitrite and nitrate are innocuous, but they are usually most reliable chemical indicators of objectionable organic matter, which has previously been present in the water.

If a nitrite is present in slight amount, and also reducing substances are present, their significance may be destroyed, since in such case this source is from nitrates.

Nitrates—Either the Thresh or Fromont procedures are satisfactory; both depending upon the reduction of nitrates by zinc dust, and the amount estimated as nitrite.

The first method is as follows:

If nitrites were absent, take a fresh 100 c. c. specimen of the water, add one tablet of sodium acid sulphate (.324 Gm.) dissolve, then add one tablet of zinc dust powder, and allow to stand for 5 minutes. Filter into another tube, add one tablet of metaphenylenediamine sulphate and dissolve, noting whether a brown color is developed. The rapidity with which the coloration is produced, and the depth of the tint are proportionate to the amount of nitrates present. With about a tenth of a part of nitric nitrogen per 100,000 a very pale brown color appears almost at once, but is still pale at the end of 5 minutes; with half a part per 100,000, the liquid is pale brown after one minute, and distinctly orange brown at the end of 5 minutes. With two parts and upwards, the brown tint appears almost immediately, the metaphenylenediamine is added, and the liquid becomes deep orange-brown at the end of five minutes.

The estimation of nitrates, in presence of nitrites, is more difficult, but is unnecessary for work in the field unless metallic substances are present in the water.

Fromont recommends the following procedure: Take 100 c. c. water,—add 1 Gm. zinc dust and boil. Concentrate to a little more than half the volume. The flask is graduated to 50 and 100 c. c. After filtration, bring back volume to 50 c. c. with distilled water. Take out 10 c. c. from this 50 c. c., and dilute the 10 c. c. with an equal volume of distilled H_2O. Add 1 ampule of Trumsdorff's reagent (1 c. c.) and 1 ampule 50% H_2SO_4. About ½ hour later, the blue color has reached the height of intensity, and the nitrites are determined. Titrate with N-100 hyposulphite of sodium, then from the number of drops used, subtract that number which corresponds to the nitrites, if there were any.

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The weight of nitrites in N_2O_5 is for 1,000 c. c.

(N.-n) .0000005x1.4225x50 or

(N-n) .0000007x50

N—total number of drops, i. e., for nitrates and nitrites.

n—number of drops used in estimation of nitrites.

The determination of the chlorides, and the nitrates, according to Fromont may be dispensed with when it is a question of a rapid analysis. They will be of great service, if it is a question of a rapid exact analysis. A fact which one can realize only after having done several analyses.

The principal source of nitrate, is organic matter, chiefly of animal origin. The amount varies with the locality. Ten parts per million is suggested as a limit.

Hardness—It is not necessary for our purposes to determine, but may be done in 5 minutes if desired.

Metals—Lead—Test for lead is made only when ammonia or nitrites are present. The slightest trace is dangerous. This test is seldom required in the field.

Determination depends upon formation of black lead sulphide when H_2S. is passed through water.

To 10 c. c. of the water add 2 c. c. of a solution of H_2S. If no brown or black color appears on standing lead is absent. If such change is noted water is acidified by adding tablet of sodium acid sulphate, and if a dark precipitate remains, lead (or copper) is present.

The H_2S solution is quickly prepared from tablets furnished for this purpose.

Zinc, iron and copper may also be quickly determined by the rapid method, if necessary.

Determination—To 100 c. c. of water, add tablet of sodium acid sulphate, and one of potassium ferrocyanide; if a turbidity is produced zinc is present. One-twentieth of a part of zinc per 100,000 can be detected. When one-tenth of a part is present, the opalescence is visible, within about three minutes, with one the water becomes turbid in a few seconds. If a blue color is developed, there is a trace of iron. If a reddish brown tint, copper is present.

Oxygen Absorbed.—We have already obtained an idea as to the presence or absence of organic matter in making the examination for residue on evaporation. This, however, alone may

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be frequently misleading. Nitrates may have prevented the charring, or charring, if present, may have been due to organic vegetable matter, which, while its presence may render the water less palatable, is not nearly so important from a sanitary standpoint as organic matter of animal origin.

Since all organic matter is oxidizable, we may gain an idea as to the amount of organic matter by determining the amount of oxygen which is necessary to oxidize it.

It has been shown that no constant relation exists between the amount of oxygen consumed and the amount of organic matter present, except in cases of water from a similar source, which have been oxidized at the same temperature (Clowes and Coleman Quantitative Analysis, page 303). By employing a proper factor under these conditions, however, the approximate amount of organic carbon can be calculated from the oxygen consumed. Thus, when oxidation has been effected at about 27 degrees C., the weight of organic carbon is equal to that of the oxygen consumed, multiplied by 2.38 in the case of river water; in the case of deep well waters the factor is 5.8.

Oxygen Consumed.—The English and the Germans determine the amount of organic matter in acid medium.

100 c. c. of water is placed in an Ehrlenmeyer flask and one tablet of sodium acid sulphate is added, then 1 c. c. of a solution of potassium permanganate made by dissolving one permanganate tablet in 10 c. c. of pure water. Heat gently for 15 minutes. If the color disappears, add another c. c. of the permanganate solution and a third and a fourth, if necessary. Each c. c. decolorized in 15 minutes corresponds to one-tenth part of oxygen absorbed by the organic matter in 100,000 of the water.

A very pure water exerts little effect upon the permanganate. The marked pink color produced by the addition of 1 c. c. of the solution of the permanganate to 100 c. c. is barely effected by the fifteen minutes' boiling. Such waters are classed as absorbing not more than 0.05 parts of oxygen per 100,000. In the cold 1 c. c. of the permanganate of the solution should tint 200 c. c. of water after standing four hours.

The amount of oxygen absorbed by the boiling water depends in the absence of nitrites and ferrous salts, upon the quantity and quality of the organic matter in solution. While definite stand-

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ards cannot be fixed, the following are given as useful guides:

Time, 15 minutes; temperature, 100 C.

A water which absorbs less than 0.05 parts of oxygen per 100,000 will probably be of a high standard purity. A water which absorbs more than 0.05 parts and less than 0.10 is probably good. Between 0.10 and less than 0.20 is suspicious, and more than 0.20 parts is probably polluted.

The advantage of this method is borne out by experience, but Fromont considers it advisable to make qualitative and quantitative determination of organic matter in acid medium, and then qualitative and quantitative determination of organic matter in alkaline medium.

Quantitative determination of organic matter in acid medium:

Method—Take 100 c. c. water. These 100 c. c. should not absorb more than .0002 gm. of oxygen. The solution of permanganate is of such strength that 1 c. c. corresponds to .0002 gm. oxygen. One ampule containing 1 c. c. of such strength of permanganate will suffice.

One ampule containing 1 c. c. of sulphuric acid 50% solution.

100 c. c. of water to be treated.

Bring to boil for ten minutes (moderate boiling). At end of this time the water remaining rose-colored has absorbed less than .0002 gm. of oxygen per 100 c. c., less than 2 mg. per liter, and can be considered potable.

To determine the amount quantitatively, two flasks are employed.

1st flask: Water, 100 c. c.; 1, 2, 3, etc., ampules of permanganate; 1 ampule H_2SO_4, 50%.

2d flask: Water, 50 c. c.; 1, 2, 3, etc., ampules permanganate; 1 ampule H_2SO_4, 50%.

Bring to boil for ten minutes and allow to cool. Preferably cool by standing flask in cold water. Now add to each flask as many 1 c. c. ampules of the solution of the ammoniacal sulphate of iron in sulphuric solution as ampules of potassium permanganate to make a persistent rose color. The solution of ammoniacal sulphate of iron corresponds, volume by volume, with that of the permanganate. The titration is completed when a rose tint is produced with the aid of the permanganate solution employing a calibrated dropper pipette, which gives twenty drops to the c. c. of

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solution. The difference between the drops employed for the two flasks multiplied by .0001 mg. will give the weight of oxygen absorbed by 50 c. c. of water, multiplied by 20 we have the amount absorbed by a liter of the water.

Estimation of the organic matter in alkaline medium:

100 c. c. of water,
1 c. c. ampule of potassium permanganate,
1 ampule containing 2 c. c. of saturated soda bi-carb. sol.

After ten minutes boiling add an ampule of 1 c. c. of H_2SO_4 50% solution. If the water returns a rose tint it will have absorbed less than .002 gm. of oxygen per liter.

The quantitative determination is made as follows:

1st flask: Water, 100 c. c.; 1, 2. 3. etc., ampules of pot. permanganate; 1 ampule of soda bi-car. sol.

2d flask: Water, 50 c. c.; 1, 2. 3, etc., ampules of pot. permanganate; 1 ampule of soda bi-carb. sol.

Boil for ten minutes and cool. Add to each flask an ampule of 50% H_2SO_4, then 1, 2, 3, etc., ampules ammoniacal sulphate of iron in sulphuric acid and titrate with the permanganate solution by means of the drop counter.

In this paper I have attempted to describe in some detail the chemical analysis of water as pertaining to those substances which act as chemical indicators of contamination. I know of no more accurate methods which could be employed in the same length of time.

These tests are the usual laboratory methods which have been modified by Thresh of England, and Fromont of France, so that they are practical for outside-of-the-laboratory application. I have had no experience with the outfit advised by Fromont. It has some features which are very desirable. The Thresh tablet system has the advantage of proven practicability and reliability. No doubt the rapid method of analysis may yet be improved and time saved without sacrificing accuracy.

We should have some such outfit or a combination of such outfits so that our sanitary officers may be able to more fully discharge their duty in protecting the health of their commands.

DISCUSSION.

Major Arthur P. Hasking, N. G. N. J., stated that he thought that with the Thresh method any error would be found in the 4th or 5th decimal

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point. Notwithstanding this rather unimportant error, the method was not wholly practical. Chlorine exists in considerable quantities in the waters of certain districts and for correct conclusions one must check up findings with the reports of the Agricultural Department. He places more dependence on nitrites and nitrates for quick analysis. He thinks there are always some nitrites, nitrates and free ammonia. "Too much weight should not be given to chemical analysis. The common method of purification with hypochlorites would give a high chlorine content. This is very misleading and resort must be had to bacteriological examination." The speaker cited the experience in his own city, where the hypochlorite method is used successfully. He also invited attention to an article by Major Russell, recently published in THE MILITARY SURGEON. From his experience he believes that first we should attempt to prevent infection of water supplies, and if infection is suspected, use hypochlorites.

Major E. L. Munson, U. S. A., announced that he believed that the method advocated would prove practical for the base and lines of communication, but he doubted if it could be carried out at the front. The observations of the water supplies with the exercise of common sense must generally be relied upon. With the provisional regiment the water from driven wells proved to be safe. In the Leavenworth clay, however, there is much typhoid.

Major Charles Lynch, U. S. A., stated that in war every source of water supply should be deemed guilty until it was proved innocent.

Major McCaughey agreed in this, but said that a sufficiently good analysis can be made rapidly.

Major P. C. Hutton, U. S. A., asked if during the Russo-Japanese War the Japanese resorted to chemical analysis of water and confined themselves to water so found to be good. He requested that Major Lynch be called upon to make a statement on this subject.

Major Charles Lynch, U. S. A., said that while the Japanese did not send parties in advance to examine the water they were very careful to do so whenever possible. This was not with a view to permitting the use of the water untreated, but with a view to finding the best water and then boiling it. The Ishiji filter was sometimes used, but only where boiling was not practicable. The speaker explained further how admirable were the means employed by the Japanese to furnish good water at every point from front to rear. He referred particularly to their canteens in which water could be boiled during a battle; the boiled water and tea stations off the line of the railroad and the larger plants at all the large towns on the lines of communication.

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NOTES ON ORGANIZATION AND EQUIPMENT FOR EVACUATION OF THE WOUNDED.

By Major J. H. FORD, B. S., A. M., M. D., Medical Corps, U. S. Army.

IT is a postulate of military science that an army should be capable of rapid movement. Inferentially it is essential that the Medical Department charged with disencumbering an army of its disabled, should perform this duty expeditiously. The importance of such duty and the necessity for its rapid performance are exemplified by Meade's contention that he did not follow up his victory at Gettysburg because he was unwilling to abandon his wounded. It is alleged that delay in removal of the incapacitated during the earlier Japanese operations in Manchuria had a perceptible retarding influence upon their army's advance upon Mukden, and thus contributed to the result that their campaign resembled those of Marlborough, rather than those of Napoleon. The delay at this critical period protracted the Russo-Japanese war and greatly diminished the eventual success of the Japanese. The importance of rapid evacuation of the wounded is such that it appears expedient to inquire whether some details in the organization and equipment of our service for that purpose might not be improved.

The system of evacuating wounded from the battlefield is that of passing the wounded from front to rear by successive units each of which operates in its own territory. The method is expeditious, but its proper performance requires a large personnel and experienced co-operation. Also the failure of one unit nullifies the efforts of all others in the chain, and the resulting confusion is aggravated by the number of those engaged. Though the method is the best that has yet been devised, it is probable that, with larger use of field railways and motor transport, it will undergo material modification.

Experience of recent wars leads to the belief that 10 per cent of an army should be engaged in its humanitarian service, 1 per cent being surgeons, 2 per cent nurses, and 7 per cent Hospital Corps.

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This proportion, in comparison with that required in former wars, seems excessive, but experience proves that it is desirable. In the middle ages those seriously wounded were incontinently slain by their comrades, or left to die. The change in the weapons used in warfare and the improvement in surgical science, with resultant diminution in mortality among the wounded, have co-operated with the growing humanitarian spirit among mankind to reduce the percentage of killed to wounded and to secure to the latter a greater degree of aid than was formerly considered necessary. To meet these changed conditions the medical and surgical service of armies has been increased, but it is generally recognized that, since armies are organized primarily to fight, their provision for the care of the wounded is, as yet, inadequate. To supplement the care they give their wounded the Red Cross Societies were organized, and, though now engaged also in other fields of social service, they make most careful provisions to meet their primal purpose. For several reasons, however, they should not, if it can be avoided, participate in the evacuation of the wounded on the battlefield. In any event, if possible, they should not act further forward than the field hospital. Though placed under military control, when called into service in time of war, as a rule they lack experience in teamwork, and that spirit of subordination and discipline which are so essential in military operations. This statement, it is recognized, is quite general, and several exceptions to it may be noted. It applies particularly to those nations whose male citizens do not learn the value of discipline by obligatory service in the Army or Navy, and which in time of war must look to voluntary enlistments to fill the ranks. The utilization of the Red Cross Societies for the service of stationary medical units at the base and on the lines of communication, liberates a larger personnel in the military establishment for the service of evacuation, and places it in service at or near the front, where it can most readily be drawn upon to replenish vacancies caused by casualties. To furnish a reserve available to fill such vacancies promptly, a portion of the military sanitary personnel should be scattered among stationary units on the line of communication in such a manner that depletion of any such unit may be compensated for by the greater activity of those left on duty with it until their regular quota can be filled by re-enforcements from the rear.

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The sanitary organization of a division should meet the following requirements:

1. From the outset it must be adequate in men, material and methods for the purposes for which it is designed.

2. To as large degree as possible it must be autonomous.

3. Its several components must be complementary.

4. It must not be subject to permanent depletion in men or material, vacancies being promptly filled from the rear.

5. It must not be designed to operate outside its peculiar province—the collecting zone.

6. It must be closely knit, but capable of very free movement of its component parts.

7. It must be highly adaptable to mutable conditions.

It is impossible to formulate any stereotyped conditions which the organization for evacuation of the wounded must be designed to meet. In war there is no normal. Evacuation is affected by the character of the wounds produced by the modern projectile, whether shell, shrapnel or small arms; the proportion of the injuries produced by each class of these projectiles; the number of wounded; the character of the battle, offensive or defensive; the numbers engaged; the physical condition of the troops and of the sanitary personnel before the engagement; the range of modern firearms; the character of the terrain as influencing ease in finding and evacuating wounded, providing cover from fire for first aid, dressing and ambulance stations; the availability of sites suitable for field hospitals; the number and character of roads and their availability for removal of wounded; the distance over which the wounded must be carried by litters and in vehicles; the character and quantity of transportation available; whether civilian teams are obtained locally; whether civilian labor is available, such as coolies for litter work; the time of the year; the length of daylight or moonlight; meteorological conditions; the availability of buildings for use as dressing stations and field hospitals; the adequacy and efficiency of sanitary personnel at the front or of Red Cross or Voluntary Aid Associations at the rear; the sufficiency of sanitary supplies where needed; the adequacy of military transportation facilities; whether troops of the line have made proper use of first aid packets; whether surgeons use diagnosis tags, etc., etc. Consideration must be given to these and other factors in effecting organization. Each of

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them singly, or several of them, has a bearing rather upon the methods of using the organization than upon organization *per se*.

The quantity of sanitary personnel on duty with troops in the field is the first point to be considered. The military unit is of different strength in different services, being the Corps in some armies, the Division in others, so that in order to effect a comparison between these, the quota of sanitary troops will here be considered in its proportion to each 1,000 of mobile troops. Further, in this article, the Division will be regarded as the basis of organization for the reason that the writer is better acquainted with it than with the Corps, and the number of troops composing it (approximately, 20,000) is such that it is readily susceptible to comparisons with the Corps, which varies in strength in different services and to a degree in the same service. Cognizance will here be taken especially of the German and French services, as they are respectively illustrative of several others.

In the American Army the sanitary personnel number 4.9% of the strength of the mobile forces. Of this number 34.7% are on duty with troops, in the ratio of 18.4 per thousand of combatant strength, and 65.3% with sanitary units, i. e., 37.2% of it serve with ambulance companies and 28.1% with field hospitals. In the French Army, on a war basis, the sanitary personnel number 5.6% of the mobile forces, of which quota 37.2% are on duty with regiments in the ratio of 21.3 per thousand and 62.8% are on duty with sanitary units, 20% with bearer companies and 42.8% with field hospitals. In the German service the personnel performing sanitary service are 6.58% of the mobile army. Thirty per cent of this quota are on duty with organizations of the line, in the proportion of 22 per thousand combatants, while 70% serve in field medical units—40% in the bearer companies and 30% in the field hospitals.

The percentage quota of medical officers on duty with regiments in the American army is slightly higher than in other services, being 2.6 per thousand, and about 2 per thousand in the French and German services. It is believed that this proportion of sanitary personnel should be maintained. There is need at the front for an adequate commissioned personnel to apply or supervise the skillful application of first dressings not only in order to assure the welfare of the wounded, but also to prevent any necessity for reapplying dressings at other points, with the

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consequent interruption of the transfer of wounded to the rear. Also the quota of medical officers at the front should be larger, in proportion to the enlisted sanitary troops, than it is elsewhere, in order that emergencies such as casualties, etc., may be met promptly and to ensure better control of the Hospital Corps there on duty, and of the stream of wounded.

The proportion of the enlisted sanitary troops serving with regiments is 15.8 per thousand in the American service, 19.3 in the French service and 20 per thousand in the German service.

It is believed that the ratios in the German service mentioned above more nearly approximate requirements than do the others here mentioned, except the quota of medical officers on duty with regiments. A division organized on this basis would require a sanitary personnel of 1,316 persons (almost 35% greater than that now provided in the American Division), of whom 111 would be officers and 1,205 enlisted men, instead of 101 officers and 877 enlisted men, as at present.

The distribution of the subordinate personnel not serving with the Chief Surgeon of a corps or division should approximately be that which is adopted in the German, Austrian and Japanese armies. The assignment of medical service to supply trains and the organization of a reserve supply train, as an autonomous unit, should, however, be effected as in the American service. It is believed that the personnel assigned to supply service in European armies lend but little effective strength to the organizations with which they actually serve, and because of the diversity of their interests from those of the remainder of the unit to which they are attached, may in effect obstruct its activities. If thirty per cent of the 1,316 sanitary personnel who should, on the German basis, be on duty with a division, were assigned to service with combatant troops, the reserve supply train and ammunition train, and with the Chief Surgeon and his immediate assistants, a total of 395 officers and men would thus be distributed. If the enlisted personnel on duty with the Chief Surgeon and the trains were distributed as they now are in the American service, the force with the combatant units would be increased from 349 to 358, i. e., to about 19 per thousand. The increase would be among the enlisted men.

If the remaining 70% of the sanitary service of a division be so assigned that 40% is on duty with bearer or ambulance com-

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panies and 30% with field hospitals, there would be 526 officers and men with the former organizations and 395 with the latter. It is believed that this proportion should be maintained at least approximately. In the warfare of the present day the field hospitals should be adequate to care for each day's wounded. dressing station than that of a hospital proper. Its equipment should be simple, and its object the further preparation of sick and wounded for transfer to the rear. if not available for early return to duty. As high a percentage of personnel as possible should be employed in the actual transfer of the wounded.

The Director of Field Hospitals should have under his immediate command, in addition to his orderly, a sergeant and two privates first class or privates. The duty of the detachment should be to ascertain before a battle what shelter is available for wounded, and what local doctors, ministers, priests, nurses and others are willing to assist in caring for wounded. They, assisted by details from the ambulance companies or field hospitals, should prepare suitable buildings for occupancy as hospitals.

Field hospitals in the German service are organized in the proportion of one to each 3,350 men. Each accommodates 200 patients, i. e., there are hospital accommodations for six per cent of the command. These hospitals are capable of expansion. In the French service the hospitals are more diversified, there being four types on duty with a corps, but their facilities for accommodation are, in effect, practically identical with those existing in the German army. In the American service there are four hospitals to a division of about 20,000 men, or one to each 5,000. Each hospital accommodates 108 patients and is capable of limited expansion. Together, unexpanded, they provide for 2.16% of the command.

It is believed that the hospital provision for sick and wounded in the American service should be larger than what is now provided and be similar to that in the French and German services, but organized in a manner different from that in either. The hospitals should be adequate to care for each day's wounded. Though this number in a given division may be so high that it would overwhelm any field hospital service that could reasonably be provided for it, an average maximum can be determined. Such an average is, of course, usually fallacious when applied to

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any actual individual condition and is of value only in determining a reasonable basis for computation.

The average maximum loss per battle day of large units in action is 12%. Applied to a division, this proportion indicates that there would be under those conditions 2,400 casualties. From this number, however, should be deducted 28% who, it is estimated, would be either killed outright or unfit to be moved. This leaves a balance of 1,728 wounded who would require accommodation. To this number must be added 60 sick, admitted in the proportion of three per thousand per day, and possibly augmented on the eve of an engagement. In any event, it is probable that 8.94% of the command will require hospital treatment each battle day. Some of these may be accommodated in habitations. In large engagements the same division is seldom engaged on successive days, which fact affords a better opportunity for evacuating the field hospitals than would otherwise be available. The loss which a division may undergo in battle—from 25 to 30%—is spread, usually over several days, so that evacuation can be progressing in the interval between its engagements. The auto-evacuation of the wounded and aid of a transport column render the accommodation of 1,200 wounded (6%) daily fairly adequate, except in battles in which the loss is unusually severe. The percentage accommodation for wounded afforded in the French and German services is obviously much more reasonable than is that in the American. Lack of adequate hospital facilities has a distinct depressing influence upon the morale of the troops and influences the popularity of the war among the civil population supporting it.

The number of field hospitals should be as small as possible, in order to avoid unnecessary reduplication of administrative, commissary and other routine service, yet it must be large enough to provide accommodation at those points to which the wounded can most readily be congregated.

The length of the line of a division entrenched is five miles; that of a division attacking in Manchuria was about two miles. Theoretically, hospitals should be placed at equidistant points behind the division or located in greater number behind those points that are most actively engaged. Practically, it will be found that there are comparatively few points near the front at which the hospitals can find shelter and other desiderata. Not

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infrequently it is necessary to place them far to the rear (sometimes ten miles in Manchuria). The erection of several small hospitals near one site is in effect the erection of one large hospital broken into sections. In such small sections much routine administrative work must be reduplicated, and men and officers available for evacuation or dressing of wounded are, therefore, otherwise engaged. A hospital which is too large, however, is cumbersome. It is believed that six hospitals, in the proportion of one (in the infantry division) to each 3,330 men, as in the German service, is the best number for general conditions. Each such hospital should accommodate 200 patients. These hospitals would accommodate six per cent of the command.

This number is adequate to reasonably cover the rear of a division if placed under ideal conditions at from one-half to one and one-quarter miles distant from each other, with two in reserve, as the field hospitals proper in the French service are employed. Only under exceptional conditions would the character of the terrain afford a greater number of available sites. In this connection, it is well to remember that Lynch inclines to the belief that the Japanese, as a result of their last war, will increase the number of their field hospitals in a division from four to six. They found that, as in the French service, hospitals on the second line proved desirable. Each field hospital should be so organized that it could be broken into sections, as are the field ambulances of the English and the corps and division ambulances of the French, in order that a portion of any one of them may be sent out on detached service. All packages should be small enough to be handled by two men. The equipment of the American field hospitals is believed to be excessive, being about three times as elaborate as corresponding units of the German army. The adoption of several types of field hospitals in our service, each adapted to special conditions, e. g., service with cavalry, as in the French service, is worthy of consideration.

If thirty per cent of the personnel of 1,316 officers and men be assigned to duty with the field hospital service, there would be 390 individuals to be thus distributed, of whom 30 would be officers and 360 enlisted personnel. The personnel subordinate to the Director of Field Hospital Service should be assigned in the proportion of five officers and sixty men to each hospital.

The proportion of officers and enlisted personnel, to the num-

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ber of wounded which each hospital is expected to receive would, under this plan, be about the same as that provided in the German service.

The Director of Ambulance Companies is charged with the collection prior to a battle of all the transportation available from both civil and military sources. These vehicles, coolies or other means of transport, he congregates at designated points, preferably those where the several ambulance companies assemble, assigns them to duty with those companies, and causes them to work, so far as possible, in conjunction therewith. In order to superintend this work he should have available, in addition to one private first class as orderly, a detachment of nine men, of whom at least one should be a sergeant and the remainder corporals and privates first class. The value of a non-commissioned officer's service in the management of teamsters and others is appreciably greater than that of subordinate personnel. The members of this detail should be vested with adequate authority over unofficial civilians who are utilized for such service. The collection of transportation should be facilitated by the issuance of adequate orders from the commanding officer to line and medical officers that they collect all transportation which is within their control.

If forty per cent of the sanitary service of a division be organized into ambulance or bearer companies, there will be 527 individuals available for such service. Of this number, on the German basis 27 would be officers, one being the director of ambulance companies, and 500 enlisted men. These should be divided into two companies of thirteen officers and 250 men each. Each company again should be divided into four platoons of 60 or 62 men each, each platoon being under the command of an officer. The platoon should be divided into squads of about six men each, each squad being under the command of a non-commissioned officer who forms part of it. Organized in this manner, companies, platoons and squads can be distributed by the director of ambulance companies with the greatest method, least confusion and least reduplication of administrative work, and eight officers are available for dressing station service.

It is desirable that the enlisted personnel of the medical department be composed of men whose qualifications are higher than the average. Upon the care and skill with which the first aid

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dressing is applied will depend, in large degree, the results of the injury, determining whether the wounded man die, suffer a prolonged or short convalescence and much or no disability. From a purely military standpoint, quite aside from the obvious humanitarian considerations, the subsequent fate of the wounded is important because of its influence upon the financial resources of the country and the availability of those injured for further service. Also it has a bearing on the political attitude with which the conduct of the war is regarded.

To secure the services of men possessing high qualifications they should not only be vested with an adequate measure of authority and official recognition, but encouraged by financial compensation and prospects of promotion. Such compensation should be at least equal to that of the highest corresponding grades in other staff departments.

There are now two factors that cause delay in evacuating the wounded, dressing stations, etc., for the sole purpose of collecting trative work in connection with each wounded man, and the other is the necessity of collecting his arms and equipment. As the man may shortly return to duty, his arms and equiment in foreign service accompany him, though the progress of a wounded man is greatly retarded thereby. It is believed that a certain number of wagons should be sent to the stations for slightly wounded, dressing stations, etc., for the sole purpose of collecting arms and equipments of slightly wounded men proceeding on foot to the rear. Each article of a man's equipment should be marked by number and letter for division, brigade, regiment and company or other organization. They should be sorted out at a designated point in the rear and redistributed by as large a working force as is required.

The Russian medical officers in Manchuria kept watch on the wagon routes, and much of their energy was more beneficially employed in hurrying up the transport than in attempting to render detailed surgical aid.

The proportion of the command which will require hospital treatment to the rear of the collecting zone is determined by too many factors, e. g., size and issue of battles, presence of epidemics, etc., to justify definite preliminary estimation. Approximate estimates only can be made. From a review of the literature, Mulligan concludes that at the outset of a campaign there should

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be hospital accommodation in the line of communication or at the base for 10 per cent of the command, and that subsequently this should be increased gradually to twenty per cent. Longmore estimated that five per cent was adequate at the outset. In the Philippines, General Greenleaf made provision for hospital accommodation for 15 per cent of the command—an estimate which events proved was most judicious. In this case, however, it was remembered that some additional 4½% would be repatriated. The percentage of sickness in a campaign should be estimated on the amount of sickness among troops in garrison in the same locality; but in some instances it is twice as great. In any approximate estimate a margin must be allowed for epidemics.

A great and important duty is thrown on the administrative medical services in the field in connection with the preparation and use of auxiliary transport of sick and wounded. As a first principle, it should be recognized that the regulation number of litter bearers, other than those attached to regiments, can only work in a very limited area (rarely if ever beyond the dressing stations), and that the ambulances of the field medical units should not be detached from them to go any distance that would prevent their rejoining their units on the same day. One can readily understand, then, that under the conditions imposed by severe fighting it would be impossible to prevent the field hospitals from becoming immobilized and unable to move on with their divisions unless there is a very considerable organization of auxiliary transport.

Hand carriage by organized groups of litter bearers from the local civil population is of immense assistance in removing the recumbent cases from a battlefield. It is especially easy where there is a large coolie population. It was practically the only form of transportation used by the Japanese in Manchuria for the recumbent cases, gangs of Chinese coolies being organized for the purpose. It was also employed in the Philippines in 1899, twelve Chinese coolies being allotted to each regiment. It was also the method adopted in Natal in 1899-1900, where a bearer corps, 1,200 strong, of European refugees from the Transvaal, and another corps of some 800 coolies, with a large number of litters, were formed. They were of incalculable value in transferring the patients from the field hospitals to the railway trains after the battles of Colenso, Spion Kop, and the series of actions

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near Pieter's Hill. (Details of the organization of these corps will be found on page 294 on the official report of the medical arrangements of the South African War.) In Continental armies auxiliary bearer columns with transport materials are organized and trained in time of peace for this kind of work all down the line of evacuation by local branches of the National Red Cross Societies. The staff of our servite has considered the formation of such auxiliary units. They are absolutely necessary for the transportation of patients over the gap between the field hospitals and the railhead, when there is a considerable distance of road to be covered and no suitable vehicles are available.

Wheeled litters are an important aid in the transportation of wounded. Several such have been devised and are used in foreign armies. One which is very popular in Austria consists of a bicycle which can be so dismounted that, with the equipment it carries, it can be so reassembled that it may serve as a two-wheeled litter. Another used in the English service consists of a litter resting in sockets fastened on the axle of a jinrikisha, from which the body, top and shafts have been removed. A very simple device consists of the following: Two stout wheels, 2 feet in diameter and with 2-inch rims, are secured to an axle about 6 inches longer than a litter is wide. From the axle rise two uprights, 2 inches in diameter and 1½ feet high, each surmounted by a spiral spring and each spring surmounted by an iron socket, 4 inches long, 2 inches wide and 1½ inch deep. In these sockets rest the side bars of the litter at about their middle points. Two ropes or straps are fastened to the axle near their middle points—one near each wheel. Each rope passes forward and backward to be fastened near its end to a stirrup of the litter, and thus hold it rigid in the sockets and fast to the axle. Light, hinged, iron legs may be so fastened by a ring to each handle of the litter that it may be kept horizontal when being loaded, and when not further needed may be folded so that they are parallel to the side bars of the litter with the free ends in the sockets. Such litters are quickly demountable, and in unfavorable territory the adventitious parts can be left at some designated point, e. g., the regimental aid station. They should be operated in pairs, so that the one man in charge of each can render help if need be, as in loading and unloading, to his

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squad mate. There should be one wheeled litter issued for the use of every dismounted Hospital Corps private on duty with troops.

The divisional escort wagons returning empty are depended upon, to an appreciable degree, by the present field medical organizations. Much consideration will therefore have to be given to the co-ordination of the work of bringing up supplies to the troops and conveying the sick and wounded back. During prolonged periods when troops are in camp, i. e., during pauses in the operations, some system of distributing the empty general service wagons at definite hours of the day to the field hospitals and evacuation hospitals may be arranged, but immediately after big battles (or during them, should they be prolonged more than two or three days), the utilization of the empty supply wagons for medical service will present many difficult problems that must be solved by the Quartermaster and medical services, acting in unison. In South Africa the Canadian field hospital had transport that could be converted into ambulance transport, and this was considered an ideal arrangement for adding to the amount of transport available for clearing it.

On the collection, preparation and use of local vehicles, one places most reliance for auxiliary wheeled transport. Some idea should be formed of its amount in each locality, and much of it can be handed over for medical services. It is generally believed that the medical pressure for transport is occasional only, but there is a daily inflow of sick, and the balance between inflow and outflow must be maintained. The pressure for auxiliary transport is constant and not merely occasional. A certain quantity, therefore, of the available local material should be assigned for the regular use of the medical service between field hospitals, evacuation hospitals and railhead. But when important battles are impending the amount should be increased to its greatest possible limit and prepared. There has been no important campaign in which this form of auxiliary transport has not been used in great quantities. In Continental armies there are definite arrangements for training men in time of peace in the methods of preparing the vehicles of different localities in a manner suitable for the transport of sick and wounded. In Manchuria both armies impressed all vehicles available, by hire or requisition, and had a personnel trained to prepare them.

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Two ambulance dogs, trained to assist in the search for wounded, should be attached to each ambulance company, and one to each regimental headquarters. These animals are employed in practically all European armies. There should be in the United States army a training station for ambulance dogs. It should be a permanent institution, located, perhaps, at some ambulance company station and provided with a fixed quota of permanent personnel. The value of these animals has been so fully attested that they are now a recognized aid to the sanitary service. In numerous tests, made in the German and English armies especially, it has been found that the dogs will find wounded quicker than will men, and will often discover patients overlooked by the latter. They can cover a wider area and do it much more thoroughly than can men in the same length of time, can easily penetrate thickets and can work better at night (when wounded must usually be recovered), or in fog, rain or snow. In modern war the firing line is enormously extended, and wounded are more often overlooked than formerly. Naturally, a wounded man seeks shelter at places where he is offered some protection, but such places are often comparatively inaccessible. If, when in such a location, he loses consciousness, from shock or hemorrhage, he is often undiscovered by searching parties. In recent maneuvers in the Austrian army 500 litter bearers, at night without lanterns, but with four dogs, recovered 200 wounded in Coblenz Wood in less than an hour. Immediately after this the litter bearers sought another 200 wounded, without the aid of dogs. After two hours' search 18 wounded were reported missing. The dogs were now used again, and found all the wounded in twenty minutes. Dogs performed good practical service with the Germany army in the Boxer rebellion, with the British army in South Africa, and with the French army in Algiers. The Russians in Manchuria used hundreds of them with excellent results. In this country the first demonstration of their value was made at the recent International Convention of the Red Cross Society.

Many varieties of dogs are used for ambulance purposes, but in general the Russian wolf hound (Borzoi), airedale, and shepherd dog give the best results. Russia uses the dog of the Caucasus; Austria, the Dalmatian dog; Turkey, the Asiatic sheep dog; Germany, collies and airedales; France, hardy cross-breeds, and England, collies and pointers. The St. Bernard is not suit-

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able except under exceptional circumstances; the bloodhound is slow, hears and sees poorly; Newfoundlands, Great Danes and mastiffs soon tire on hot marches; pointers and setters are prone to hunt game; greyhounds lack intelligence; bulldogs are too pugnacious, and terriers are too small. The animal utilized should not be of a high-bred strain, but of a rougher, commoner variety, better able to stand exposure. The dogs selected should be young and of an inconspicuous color. Females are more easily trained than males. The training of the ambulance dog in the English service lasts about four months. It requires not only care but patience, sympathy and insight, so that the instructor can appreciate the dog's point of view. This training is either carried out by a medical officer himself or by a carefully selected subordinate under his personal supervision. The training is based on the greediness of the young dog. Also puppies are taught to run with a well-trained mother, and she helps them to learn.

Preliminary teaching consists in instructing the dog to answer a call, to follow or lead without a line, to lie down, to sit down, jump, bark, and remain on guard. A further course of training includes the elimination of gun-shyness and the desire to hunt. It also includes swimming, seeking and fetching lost articles, carrying messages, and, finally, seeking of wounded and, by barking or other action, indicating their discovery. The dogs are not allowed to run aimlessly. They are made to search ditches, thickets and other hiding places with especial care.

In the Italian service the animals are taught, when they find a wounded man, to remain with him and bark, or to run to the nearest relief and lead the way back. The former system is better for day work, the latter for night work. In the Austrian service the dog takes the man's cap to the nearest squad or runs part way back while barking. The dogs pay no attention to each other when hunting. In the Belgian service especial attention is given to teaching them to swim, scale walls, guard baggage and field hospitals and to carry messages.

In Italy and France there are establishments maintained solely for the purpose of training ambulance dogs, and to these points officers come to receive instructions in the subject. In England, Austria and other countries instruction is carried on, but not at establishments created solely for that purpose. In Germany a

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society for training ambulance dogs was founded in 1893. It has rendered excellent service in training these animals, but is not a government institution.

After the dog is trained he should be kept in practice by weekly tests and by more frequent exercises. The animals are fed twice daily on soup, meat (in limited quantities), rice and bread. The cost of the subsistence of the animals, in comparison with the service they can render, is trivial.

As soon as the dogs are well instructed they should be sent from the training station to the senior surgeon on duty with each regimental headquarters, until the quota mentioned above has been furnished each regiment. The surgeon should be held responsible for their further training and efficiency. They should remain attached to the regiment. Each dog, like each government horse, should be accompanied by a descriptive list.

An equipment for ambulance dogs is not necessary, but in most services they are required to carry a few light articles for the use of the wounded. Thus, the English ambulance dog wears a light canvas saddle with two flaps, each marked with a Red Cross, a collar and a large bell of standard tone and weight. Attached to the saddles are pockets for first aid packets, bandages and flasks containing stimulants and water.

Ambulances were used in the Civil War in the proportion of one to each 150 men. Our present provision on paper is in the proportion of one to 300 men. A part of the present provision is in effect fictitious, for many of the ambulances now in service are old, of divers types and, by giving a false impression of availability in time of war, are worse than useless.

All ambulances except those of the most recent type should, if possible, be disposed of and replaced by others, all of one type, whose several parts (e. g., the tongue) should if possible be made interchangeable, to a large degree, with corresponding parts of the escort wagon.

The device invented by Major Winn, whereby each ambulance can carry six recumbent patients, should be installed in new ambulances. Motor ambulances are described under the caption of motor traction. Unless motor ambulances and field railways are employed, a higher proportion of ambulances than that now provided will undoubtedly prove necessary for prompt evacuation.

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Horse litters are not as yet formally adopted by our army. They are used to a limited degree in foreign services, and with cavalry on scouting duty they are of obvious value. An excellent device of this character, exhibited by Captain H. L. Brown of the U. S. Army, was seen at the recent International Red Cross Conference.

Similarly, galloping ambulances, such as were used with success in South Africa, should be employed by sanitary troops accompanying cavalry, in the proportion of one to every two privates of the Hospital Corps, if horse litters are not available.

A system of signals should be devised for the use of the Medical Department in order to expedite the operations of its units. The subject is already under consideration in foreign armies, but as yet no details have been workd out. It is probable that pyrotechnics will prove the means finally adopted for this purpose; rockets or Roman candles for use at night, and "fireworks," such as the Japanese employ, for use during the day. Signaling by a primitive form of the latter is already used by our troops for recall at some maneuver camps. Acoustic signals for the Medical Department are discussed by Romany in the *Militar Arts*, Vienna, 1909.

A system of illumination of the battlefield at night should be selected. In South Africa the British used acetylene searchlights to much advantage, though they presented the fault of throwing deep shadows over the depressions and behind thickets, the very positions where wounded must seek shelter. Before Port Arthur the Russians used captive balloons from which depended strings of pyrotechnics. While a large portion of the sanitary force available hurriedly collected the wounded, others, on numbered maps of the area, carefully noted where lay some wounded that might be recovered after the illumination had gone out. A recent device is a pistol which will throw a bullet, according to the charge used, a distance of from 50 to 150 feet. Its bullet is a capsule which will explode at a predetermined distance and shed a brilliant light over an area some 50 feet in diameter. It is the best device yet developed for use in the search for wounded.

Motor traction behind the firing line, as originally proposed by Major Clyde S. Ford, in 1901, would be a material addition to our present means of transport. It would reduce the difficulties

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of evacuation, rapidly bring up supplies and ammunition, keep the evacuation hospital and field hospital in touch, and, last but not least, prove an immense humanitarian advance by saving time, danger and suffering in removing the wounded from the collecting zone.

A motor ambulance designed by Captain Hawey, Royal Army Medical Corps, has the advantage of highness, handiness, speed, comfort, maximum accommodation and adaptability. Also, it is relatively inexpensive. The chassis is 13½ feet long, over all; the inside height is 6 feet, the total over-width is 6½ feet, and the external height is 8½ feet. The wheels are solid, and the smaller pair allow half-locking. The wheel base is short. The car is provided with 45 horse power, 4-cylinder engines and can attain a speed of 30 miles an hour. It can carry twelve patients, two being recumbent. Such a vehicle is especially serviceable between the evacuation hospital and the advanced base.

To efficiently equip our ambulance companies, it would be well if each, on mobilization, be provided with three light, swift, 10-20 h. p. cars and three slower, 15-35 h. p. cars, with greater accommodation for patients, all being fitted with special tonneaux, such as the Hawey car described above. The small motor cars can be used on the line of march to remove to the hospitals those who fall out. During an engagement they could be placed under the orders of the officer commanding the ambulance company. The large motor cars during the advance could be employed in removing the daily sick and wounded towards the base and replenishing the medical stores and equipment of the field hospitals. During an engagement they can be used in assisting the light cars between the dressing stations and the field hospitals, or in removing the wounded from the field hospital to the evacuation hospital.

The evacuation hospital should be able to requisition light cars to enable them to take over and provide for the proper care of the scattered seriously wounded. If the evacuation hospitals find it necessary to advance from the railhead they should be provided with heavy motor cars to enable them to maintain the evacuation of the sick and wounded to the advanced base.

For some years past various European countries, notably France, Austria, Germany, Russia and Switzerland, have subsi-

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dized organizations of automobilists, paying the owner of each car listed in the organization to a certain annual stipend, on condition that in time of war the services of his car would be available for military use. Cars are subsidized for a period of five years, which is considered the average life of the vehicle. Provision is made and plans and apparatus provided whereby after the tonneau or limousine is removed there can be mounted on the chassis of some cars a suitable framework for litters. Membership of the automobile owners in organizations subsidized by the government is voluntary and optional except in Austria. The development of motor transportation in the American army has been retarded by the poor average condition of roads and bridges as contrasted with those in Europe.

The following classes of cars for removing wounded are recognized by French authorities:

1. Tourist cars including coupes, landaus, limousines, etc., accommodating from two to eight persons, of from eight to sixty horse power, and weighing from 1,100 to 1,800 pounds. Speed is from about 20 miles an hour, on the average, to 40 miles an hour. These conveyances may be used for the following purposes: to carry help rapidly from one point to another, and for use in inspections, especially in large camps. Among advantages which they possess are the following: they can be used on imperfect roads, can be easily entered and vacated, and possess adequate qualities of resistance in campaign.

2. Industrial vehicles comprise those that may transport from 1,000 to 6,000 pounds of freight, having a speed of from 7 to 10 miles an hour. They are capable of propulsion by alcohol, gasoline or fuel oil. These cars are such as can be employed in convoy, and are easily managed, repaired and controlled.

3. Conveyances holding 30 to 50 people, such as the large cars employed for sightseeing parties in many cities. They are a good means of evacuation but can be used only on good roads. They should have a speed of 10 miles an hour. They are desirable for the evacuation hospitals.

4. Motor ambulances. These are the best vehicles for evacuation hospitals, being especiallly well adapted for transportation of wounded. They are already employed in the French and English services.

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5. Traction engines, of the Renard type, employed for road traffic. These cars, coupled together, run at a speed of from 7 to 8 miles an hour over any kind of road.

One advantage of automobiles is the more rapid service which they give, but another, equally important, is the shortening of the road space of a column. Machines propelled by steam are better for transport of fracture cases than those propelled by explosions. Cars of all kinds can be equipped with devices which render transportation of wounded easy if the limousine or tonneaux be removable.

Street cars may also be used for this purpose in cities or on suburban electric lines. In Savannah during the Spanish-American War an open trolley car was fitted up by Colonel Appel with devices for use in the transport of sick and wounded and rendered excellent service. The litters extended transversely across the car, their handles resting in brackets or loops fastened to the uprights. The seats had been removed from the car.

One of the most remarkable features of the war in Manchuria was the rapidity with which the Russians cleared the field of masses of wounded. Very few were left behind when they gave way before the Japanese. This was due to the use by the Russians of the field railways. Decauville wagonettes were run as ambulance trains of twenty-five cars or less from the various positions held by the fighting troops to the main line of the railway, and the wounded were then removed with greatest rapidity. Where there is a network of field railways no better, easier, or more rapid method of transport auxilliary to the transport of the medical units can be imagined. They were used also by the Japanese in Manchuria and by the British in South Africa. It would be well for the staff of a field army to consider how far such a railroad can be placed at the use of the medical service during battles. The field service regulations of the American Army take but little cognizance of even the existence of such railways, and none whatever of their service for the sanitary service, but it is probable that they will prove of imperative value in future wars.

The value of permanent railways is obvious, and when a line of rail is in working order in or near the area of operations, every possible advantage should be taken of it; as much rolling stock as possible should be brought up for transport of sick

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and wounded in anticipation of a conflict, and a spot selected near the line in which the slightly wounded can go direct. The use of the railway line for removing large numbers of sick and wounded during a retreat by trains running *en echelon,* at intervals of a few minutes was practised with much success by the Russians at the battles of Liaoyang and Mukden.

Hospital trains are units, which like evacuating hospitals, are mobilized in the proportion of one for each division in the field; but at present they consist only of a personnel sufficient for taking care of 108 sick and wounded lying down. There are no especially constructed hospital trains in this country, with kitchen car, operating room, dispensary car, etc., such as are kept for mobilization purposes in Europe. Such trains should be provided. With us a hospital train will have to be improvised out of passenger, Pullman, dining, tourist, express and freight cars. The collection of rolling stock, bringing it up to the railhead, arrangement of suitable time tables to make it most available for the daily evacuation of the sick and wounded down the line, and the framing and issuing of orders on the subject require preliminary consideration. One knows that quantities of all kinds of material must be brought to railhead, and with a knowledge of the amount of rolling stock employed for this purpose an estimate should be made in advance of the amount required on the return journey for the evacuation of the sick and wounded with the field army. If the service relies on volunteers it should secure from each large railroad recommendation of men acquainted with railroad service who would be prepared to take over the business at once at a stated compensation.

Definite and systematic arrangements are thus possible, upon which the administrative medical officers of divisions and the line of communication may act. In Manchuria the Japanese had a perfect system of evacuating by railway trains, these being timed to start from railhead daily. Evacuating hospitals were thus always able to send away detachments of patients at a fixed hour. Under existing conditions, the unit "hospital train" is one that will have to be improvised, except as regards *personnel,* at the beginning of a campaign. As military operations proceed, more permanent hospital trains will, no doubt, be placed on the lines, as was done in South Africa. It is a prime necessity that hospital trains run regularly down the line. Also they

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should come as near the area of operations and firing line as possible. Enormous numbers of wounded were removed by the Russians during the battle of Liaoyang and Mukden by means of the main line and light field railways, which formed a network right up to and behind their positions. It was only to their excellent organization for evacuation by railway that their remarkable success in clearing the field of wounded was due. When freight cars are used for evacuation of wounded the floor should be covered with straw or such material before the wounded are placed on board; also these cars if possible should be used for the slightly wounded only.

In foreign services evacuation trains, called sanitary trains, are of three kinds.

I. Permanent. II. Improvised. III. Ordinary trains.

The first are established in time of peace and have special cars. Each great railroad system in Europe can furnish one of these and the sanitary service had in storage its equipment. Such provision should be effected in this country. It is a veritable "Train de Luxe" and requires special means of transport, which at the time of concentration of troops can be used either for transport of troops or their refreshment. It is used only for the most seriously wounded. It cannot be multiplied indefinitely, for such a train requires a large personnel, much material, and many cars for relatively few wounded. One of these trains has a capacity for 128 wounded, but with larger cars now coming into use will have a capacity for 256. Each of these trains has 33 cars, of which 16 are for wounded, 2 are for personnel, and 5 for supplies. Each car for wounded can carry 8. Wounded lie on beds in two tiers, upper and lower, and there are facilities for the same care as in hospitals. The cars communicate like Pullmans and form a true rolling hospital.

There are about twice as many cars to a hospital train in foreign services as in the United States, but as the cars accommodate fewer patients this disparity in accommodation is not so great as would appear. Thus, coaches of the hospital trains of the Paris-Lyons-Mediterranean Railroad Company of France carry only 16 patients each, and the coaches of the Oest and Orleans Railroad Company accomodate only half that number. In several foreign countries railroads are subsidized to keep in

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service a certain number of cars especially constructed for conversion into hospital trains on short notice.

The personnel of all such trains is definite, composed of one medical officer, two non-commissioned officers, and 23 men of the Hospital Corps.

Improvised hospital trains are used in all armies. In order to effect such improvision in our service 500 stands of the Beck apparatus have been purchased by our Field Supply Depot. These can be so adjusted in freight cars that they will each accommodate three tiers of litters. Similar contrivances are used in foreign services, where the railroad companies keep ready all the necessary fittings for this conversion. The hospital equipment and surgical stores for these hospital trains are held in storage in the army depots. Similar equipment should be selected and stored for our service. These trains are specially intended for the transport of the severely sick and wounded from the zone of the field army directly to general or base hospitals.

Improvised trains may also be prepared by such means as the following: Against each wall of a freight car are fastened three tiers of sockets, at such distances that they support three rows of opened litters, by the handles on one pole of the litter, in such a manner that the litters hang vertically against the side of the car, *i. e.*, each upper handle rests in a socket. Above each socket there is nailed to the wall a hanging strap with a loop at its free end. When the litters are brought out vertical to the side of the car, these loops are slipped over the handles of the pole not resting in the sockets and retain the litters in this position. A litter with a stronger cross-brace than that which our service employs and one which is non-collapsible is essential. When going to the front these litters are lowered against the walls of the car and the car is filled with freight. When returning the litters are taken out of the sockets, patients are placed on them, the handles of one side of the litter are slipped into the sockets and those on the other into the loop. Cars of this type are in constant service in the Panama Canal Zone.

The preparation of an improvised hospital train in France is carried out according to a carefully prearranged plan in about seven hours. Each car is numbered and marked with the Red Cross. The personnel varies according to the nature of the cases carried, but there is an average or normal quota which

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may be augmented or diminished as the commanding officer of the line of communication considers necessary. In Russia trains can be equipped according to a system recently adopted in two hours. In the French Army ward utensils for equipment of each improvised hospital car are kept assembled in units for immediate distribution. These are such articles as a cup and water bottle for each patient, bed pans, bed urinals, spittoons, commodes, etc.

The improvised trains in France are freight trains, which are returning to the rear, after having brought freight to the front. Each train consists of forty cars, able to carry 400 wounded. There are 396 beds, there being twelve for each of 33 cars, and four patients are seated in the car for the personnel. The train is often loaded at successive stations, a portion of its load coming from each. The cars of these trains are if possible those having end to end communication and are provided with windows and other means of ventilation. Such apertures are covered with metal gauze to keep out dirt and cinders.

The personnel of an Austrian extemporized hospital train consists of one surgeon captain as commander, who has disciplinary power of a company officer over all on board the train; one surgeon lieutenant, one pharmacist, four non-commissiond officers and thirty men of the Hospital Corps. Each train is a primitive rolling hospital.

The improvised ambulance trains in Germany are intended solely for patients able to sit up during the journey. The equipment for these trains is similar to that provided in the French service, and is stored in the advanced "Medical Supply Field Depots," in such quantity that each Army Corps of 41,000 men is provided with material for two ambulance trains. No definite organization of personnel is laid down for these trains; it is obtained from the troops on the line of communication or from Voluntary Aid Societies. The command of such a train must be given, as a rule, to a medical officer. Failing such, the train is commanded by an officer or non-commissioned officer of troops, but a medical officer or a local civil doctor must supervise the loading and unloading of the train. All such preliminary arrangements for equipping trains, should be effected in our country in time of peace.

Waterways have been used for auxiliary transport of sick and

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wounded direct from the battlefield, as for example during the Soudan Campaign, the Civil War and frequently in the Philippines. Where suitable boats or barges are obtainable and a good waterway exists, transport by water is the most favorable for the serious cases. In anticipation of an engagement preparations should be made for bringing the boats as near the firing line as possible. Waterways are also used to great advantage in the evacuation zone. They were the most favored routes of evacuation before railroads were introduced.

Provision for the transformation of commercial ships into hospital ships, and for their approximate equipment should be made in time of peace. In some services such ships are selected for this purpose and subsidized.

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A NEW TRAVOIS: A PLEA FOR ITS ADDITION TO THE EQUIPMENT OF AMBULANCE COMPANIES.

By Major WILLIAM W. RENO, Medical Corps, U. S. Army, Commanding Field Hospital No. 1, and Ambulance Company No. 1.

THE origin of the travois is unknown. Modifications of it were found in many sections of America when the country was first discovered. The earliest travelers among the North American Indians found it in common use among those primitive peoples.

Parkman in his "History of the Conspiracy of Pontiac," Boston, 1835, p. 601, states that in the war with Pontiac in 1763 the colonists carried their wounded in this vehicle. Lewis and Clark on their western expedition in 1805 used a travois to transport a wounded hunter.

The origin of the word travois (plural, travaux) is obscure. The early names found in common use for this vehicle were travée, traversine, travail, travaise, traveau, travoir, travor and travois. The Indians used their ordinary tepee poles in constructing the travois.

Figure 1 gives a type of the travois as found among the early Indian tribes. The Dakota and Sioux Indians had a travois which was a great improvement over the travois usually used. See Figure 2. They used straight mountain pine or oak saplings about 30 feet long for the travois poles. The saplings selected were trimmed to about 2½ inches in diameter at the butt and 1½ inches in diameter at the smaller end. The butt ends were lashed to the pony's saddle, and the small ends trailed on the ground. Two or three poles were usually lashed together to give greater strength. The couch was lashed to the poles and consisted of an oval ring of ash saplings bent into the desired shape while the wood was green. This oval was about 4 x 3 feet in diameter. A network of rawhide was lashed to the oval to form the bed. A blanket, a piece of canvas or buffalo robe, was lashed to the lower rim of oval. The patient was placed on the rawhide

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network, the blanket then thrown over him and lashed to the upper part of the oval.

In our Indian wars Army medical officers very quickly saw the value of the travois for emergency hospital transportation and began to use it as a regular method of transport.

The earliest report on the travois by an Army medical officer appears to be that of Surgeon C. R. Greenleaf, U. S. A. (late Brigadier General, U. S. A.), dated December 14, 1874.

Figure 3 illustrates the type of travois he proposed to the Surgeon General for Army use. The bed was of canvas, and the ropes at the head end were quite slack, so that the head and shoulders of the patient were approximately level with his feet. The bed portion of the travois was detachable and could be used as a hand litter.

On April 15, 1876, Assistant Surgeon P. J. A. Cleary, U. S. A., sent to the Army Medical Museum a model and descriptive statement of a travois he recommended for army use. It was a slight modification of the Greenleaf travois. Several other Army officers, notably Girard and McDougal, invented travaux, which were used more or less in frontier warfare.

In order to illustrate the early use of the travois in Indian campaigns, a few extracts from reports on the subject by Army Medical Officers are given.

In a report to the Medical Director of the Department of the Platte, dated April 12th, 1876, Assistant Surgeon Curtis E. Munn, U. S. A., stated:

> The march for days was over mountains. * * * Corporal Moore, Company D, 3rd Cavalry, had been rendered helpless by a fall of a horse upon his body, and for several days he had been transported in the rear of his battalion on a rude imitation of an Indian Travail. * * *
>
> On the morning of March 17th, after an exhausting night march, the command struck an Indian village on the Powder River and fought for several hours, the Indians making a brave defense. As soon as they were driven from their village it was easy to construct travaux from the lodge poles. * * * We followed trails over mountains and ravines where it seemed impossible for a horse to go. * * * To keep up with the column often necessitated a trot or gallop. * * * All cases were brought safely. * * * I would recommend this mode of transportation wherever troops are obliged to leave wagon roads. * * * The travail poles must be well seasoned and of elastic material as ash, lancewood or hickory.

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Surgeon A. Hartsuff, U. S. A., with his report of sick and wounded for June, 1876, mentions the use of the travois, after a battle with Sioux Indians, as follows:

The wounded were all collected together and their wounds hastily and rudely dressed. * * * One two-horse littter and five travois were made. Captain G. V. Henry, 3rd Cavalry, was placed on the litter (See Fig. 4) and five of the wounded soldiers were placed on the travois (See Fig. 5). The remainder of the wounded (thirteen in number) rode their horses. * * * I soon discovered that the litter was much better in all respects than the travois, except, perhaps, over comparatively smooth ground. Much of our route was very rocky and broken, the hills were very steep and the canyons deep. Over such country, the travois is very troublesome and uncomfortable, so much so that we threw away all of them and made litters in their stead.

The following abstract is from the report of sick and wounded made by Assistant Surgeon J. W. Williams, U. S. A., after the battle with Indians at Little Big Horn, June 25, 1876:

I made use of ten travoises to transport the wounded from the battle-field of the Little Big Horn, June 25 and 26, 1876, to the boat at the mouth of the Big Horn. The distance was thirty miles; time of march, night; the country to be traversed, rough and broken; the Little Big Horn had to be forded six times—obstacles to test the merits of the travois as a carrier of wounded. Yet the wounded were transported to the boat without accident or personal inconvenience and discomfort of any kind. I am of the opinion that the travois is well adapted for transporting wounded over rough country; that it is as safe and free from jar as the mule-litter, also resorted to on the same occasion; and that it is far more economical than the latter in the number of attendants and animals which it requires. It is well known that the Indians use the travois for carrying all sorts of baggage, and that it is no impediment to rapid marching and that in case of battle their wounded are quite as speedily removed from the field by the same means.

Assistant Surgeon J. H. Patzki, U. S. A., in a report on sick transport forwarded from Fort D. A. Russell, Wyo., Jan. 25, 1877, states:

In Indian warfare wagons and ambulances are usually pushed as far as the nature of the territory will permit, but when the column cuts loose from the train there is, as a rule, nothing provided to carry the sick and wounded. The Surgeon relies on the old traditional travée or on the mule litter, which ordinarily can be easily extemporized. * * * In

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case an Indian village is captured, abandoned travées, ready for use, are usually found.

From personal experience, and from conversation with the wounded, I consider the travée decidedly inferior to the litter. * * * The patients are comfortably carried in the latter, if properly constructed and provided with a hood, and especially if so constructed that the rear animal can see the ground and pick his way, and if the animals are well selected as to gait and temper, and carefully led across the gulches and obstructions, to prevent the rear animal from jamming against the one in front. They have the additional advantage of allowing suspension of the fractured limbs and carrying some medicines and dressings in them, while streams of moderate depth are crossed with less difficulty than with the travées.

In deep snow, on account of the stumbling of the animals, hampered by the litter and on account of the smooth gliding of the travée I would prefer the latter. The travée has the advantage that its rear end can be lifted and carried over obstructions. I have found that wounds of the trunk and even fractures of the thigh, if welll dressed in plaster, are less painfully carried in travées than injuries of the head and fractures below the knee, as patients with the last named injuries are more distressed by the jarring and bumping.

If the poles are unduly slender and elastic and the canvas too baggy, the patient is apt to have the greater part of the bed come in contact with the ground, especially if this be uneven or covered with brush. Weak, fainting patients are apt to collapse into a heap and to be dragged or possibly dropped out through the carelessness of nurses, as I have witnessed. In the litter patients can be secured by surcingles. * * * The travée, the simplest, but rudest, possible conveyance, is the last refuge.

After our Indian Wars the travois gradually fell into disuse, but not, however, before Surgeon Greenleaf greatly improved it.

He modified it in such a manner that the regulation army hand litter could be readily attached to it as the couch, and as readily detached. He also made it in sections so that it could be quickly assembled or packed into convenient bundles when not in use.

The improved Greenleaf travois is the one now issued to the Army. See Figure 6.

Probably the most exhaustive test that the travois has had in recent years was made last summer on the 1,000-mile test march made by the 4th Field Artillery (Mountain Artillery). On this trip the Artillery had no wheel transportation whatsoever. All supplies and other equipment were carried on pack mules.

The object of the trip so far as the Mountain Artillery was concerned was primarily to test its efficiency in the most rugged and mountainous country, leaving roads behind.

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A serious problem was to devise suitable medical supply and transportation for such a trip. Ordinary ambulances were wholly out of the question. The medical equipment finally decided upon was an infirmary capable of being transported on four pack mules (one of the four mules carried water in water bags) and a sick and wounded transport consisting of four travaux, one wheeled travois and one galloping ambulance. Special sleeping bags were added to the travaux. Thus six recumbent patients could be carried at one time.

The test given this equipment was most severe. The march covered a distance of 844 miles, of which approximately the first 150 and the last 50 miles were over the hot, dry and dusty plains east of the Rocky Mountains, and about 40 miles more over the desert portion of the San Louis Valley. The remaining 604 miles were over foot hills and mountains. The following mountain passes were crossed:

Hayden Pass,	elevation	10,846	feet.
Pass between Creede and Lake City,	"	11,545	"
Cotton Wood Pass,	"	11,900	"
Fremont Pass,	"	11,300	"
Argentine Pass,	"	13,286	"

The Continental Divide was surmounted four times. In many places the trail was wholly impracticable for ordinary wheeled transportation.

At times, due to the narrowness of the trail, it was necessary to separate the galloping ambulance from the command and return it in a roundabout way by a more practicable route. All kinds of weather was encountered, from dry, hot and dusty, to rain, hail, snow and freezing cold.

During the entire 844 miles the travaux kept up with the command and rendered service.

The travois, however, is not practicable for carrying patients over long distances. (I can find no record in Indian wars of their being used for distances greater than 50 or 60 miles). It is practically impossible for a mule to drag a travois with a patient upon it up a mountain side. The friction is so great that the mule soon becomes exhausted.

While preparing for the Mountain Artillery march and during the progress of the march the following travois defects were noted:

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(a) The strap iron shoes on the runners wore through after dragging a patient about fifteen miles over ordinary Wyoming and Colorado roads. If wooden shoes, made from wood found along the route of the march had not been improvised to replace the iron shoes, it would have been necessary to carry along about 1,000 pounds of iron shoes (i. e., four pack mules laden with travois shoes) to keep the travois from wearing out entirely. On the march, new wooden shoes about two feet long, two inches wide and four inches thick were worn out almost daily, due to the tremendous friction.

Note the wooden shoes in figure 7. These shoes were originally two by four, but, due to the tremendous friction, they were worn down to a point at the rear end in one day's travel. This picture was taken just after the travois and attendant had finished the 844-mile march.

(b) The attachment of the shaft poles to the side poles is unsatisfactory. With the jarring and jolting caused by rough roads the shafts often become loosened from the side poles and occasionally pull apart. On the march it became necessary to bolt the shafts and side poles together.

(c) The rear cross bar has its wood work so much cut up with metal devices that it is frail and breaks readily. These bars broke repeatedly on the march.

(d) The authorized harness for a travois is a two-inch breast strap with traces and a back strap. The traces are fastened to the side poles. Due to the traces being immovable, the breast strap slides back and forth across the mule's breast when in use and in a short time causes a sore breast. To obviate this sliding motion a single-tree was added to the travois. See Fig. 7.

(e) The two-inch breast strap often cuts into the mule's breast after dragging a heavily laden travois for some miles. This was overcome by using a collar and hames in place of the breast strap. See Fig. 7.

(f) It is wholly impracticable for a man to ride the mule dragging the travois. The McClellan saddle placed on each travois mule (See Fig. 7) was used solely for carrying the field kit of the orderly and patient. Each travois orderly walked during the entire march (unless when crossing a stream, etc.), and led the travois mule.

As will be observed, it was necessary to modify the Greenleaf travois greatly before it was fairly serviceable on a long march.

When the Indians used the travois their trips were usually over prairies where the travois runners macerated the grass and thus produced a sort of lubrication. Even in such cases if the travois was used for any great distance the horse was ruined, so I am reliably informed. Horses, however, were cheap in those

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days. The Indians never used the travois on roads. On the Artillery march we used it principally on roads and trails where the friction was tremendous.

The ordinary travois may be of some use on the battlefield for short hauls, but it is impracticable as a regular transport for patients on an extended march.

If it is to be made practicable for such service it must have a pair of wheels added to it.

Had it not been for the wheeled travois and the galloping ambulance on the Mountain Artillery march, transportation of the sick and injured would have been impracticable at times.

The kind of wheeled travois recommended for such marches is very simple in construction, just an ordinary litter with shafts at one end and wheels at the other. See Fig. 8. When wheels are used on the travois a single-tree is unnecessary.

The wheels and shafts should be readily attachable and detachable. Simple metal yokes render this possible.

A wheeled travois of this description would be very light, extremely light running—the greatest consideration—and could be transported readily on a pack mule when not in use. (The litter could be made folding if desired.)

Such a vehicle would render good service and could accompany Mountain Artillery or any other command over mountains or anywhere else that pack transportation could go.

The greatest use, however, for the wheeled travois as herein described, is on the battlefield. Every regulation four-mule ambulance should carry the necessary shafts and wheels to improvise its four litters into wheeled travaux.

The weakest link in our chain of evacuation of wounded from the battlefield to the field hospital is that between the first-aid stations and the dressing station.

Paragraph 630, M. M. D., 1911, gives the third duty of an ambulance company as follows:

"To carry the wounded on litters (from the aid stations) to the dressing stations or the farthest point reached by the ambulances."

Every one knows how exhausting it is for two bearers to carry a heavy patient on a litter for a quarter of a mile or more. Let us consider a case, operating under present conditions. An ambulance company is attached to a brigade of infantry. A severe engagement has taken place. The ambulances, due to obstacles,

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are unable to approach the battlefield nearer than one-half mile. Two hundred and fifty wounded men, transportation required, are at the first-aid stations or lying on the battlefield. The ambulance company has forty bearers—twenty litters—available for duty. *Problem.* How long will it take the litter bearers to transport the wounded from the battlefield and how long will it be before they are so tired that they can hardly transport themselves?

If each ambulance had four-wheel litter travaux much of this exhausting bearer work could be avoided. After the ambulances had reached the farthest point forward, the same men mentioned above could assemble forty-eight travaux and attach the forty-eight ambulance mules to them, using the ambulance harness.

Thirty-six of the forty bearers and the twelve ambulance drivers would become travaux attendants and start for the battlefield. Four bearers would carry two litters.

The enormous increase in transporting power so easily provided is readily seen. Under present arrangements, twelve ambulances with drivers and forty bearers can send but twenty litters to the battlefield. With the slight change herein proposed, the same men can take 50 litters—forty-eight travaux and two hand litters—to the scene of action. Much exhausting bearer work is also avoided.

One attendant can readily load or unload a travois as the mule can be tied to a tree or picketed during the process.

The disadvantages of this ambulance travois system are insignificant, its advantages overwhelming. Some of its advantages, briefly stated, are:

1. It greatly strengthens the evacuation of wounded chain at its weakest link—that between the battlefield, the first-aid stations, and the dressing station.
2. It more than doubles evacuation capacity between the battlefield and the ambulance head.
3. It uses the ambulance mules and ambulance drivers at a most critical time, a time when otherwise they would be idle.
4. It diminishes greatly laborious litter-bearer work.
5. It provides more rapid transportation than by litter bearers.
6. It enables the wounded to reach the field hospital much sooner than otherwise. Many lives would thus be saved.
7. With this system, members of the Hospital Corps can give more attention to wounded than when exhausted by heavy bearer work.

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8. It would be a physical impossibility for litter bearers to carry wounded on litters continuously for twenty-four hours. The wheel litter travaux could be used for that period of time without great hardship.

9. The travaux can carry the Dressing Station equipment forward when pack mules are not available.

10. Travois spare parts can be carried in the Dressing Station wagons. One extra wheel can be carried on each ambulance.

11. If a litter is broken, it is easily replaced. If shafts are broken, they can be improved from saplings. If a wheel is broken where another is not at once available, a sapling can be used temporarily in its place as a drag. The same metal yoke that attaches the wheel to the litter will fasten the sapling to the litter. See Figs. 9 and 10.

12. Sick transport for Mountain Artillery would always be available for instant use. If the Mountain Artillery remained on roads the regulation ambulances could be used. If they left the road temporarily two lead mules could be detached from each ambulance and used with travaux.

13. After the litters have been used on the battlefield for travaux purposes they are available for use in the ambulances as beds.

14. Suitable drills can be improvised that will soon develop great proficiency in the use of the wheel litter travois.

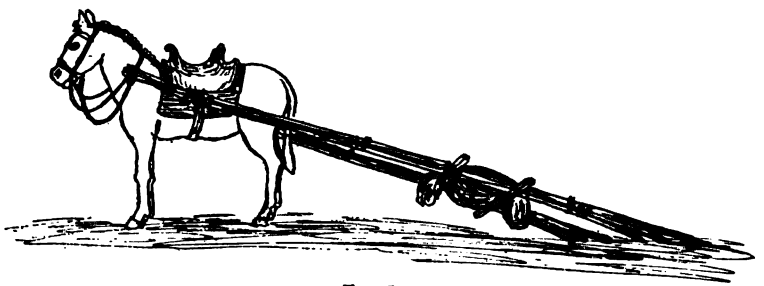

FIG. 1.
The primitive Indian travois.

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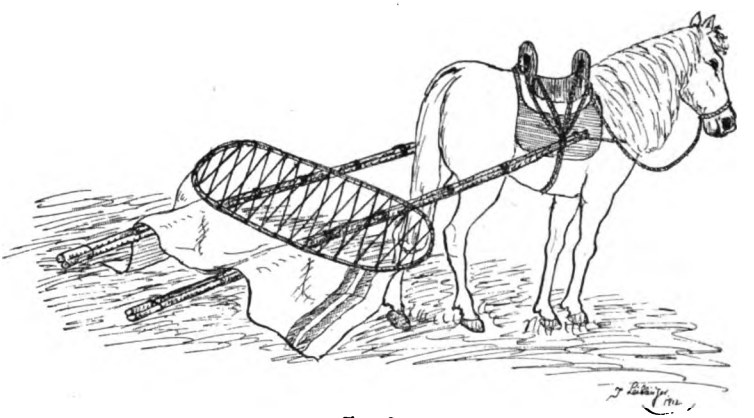

FIG. 2.
Travois used by the Dakota and Sioux Indians.

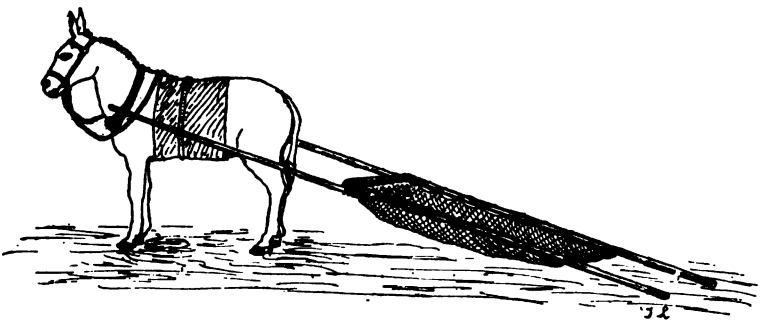

FIG. 3.
The original Greenleaf travois.

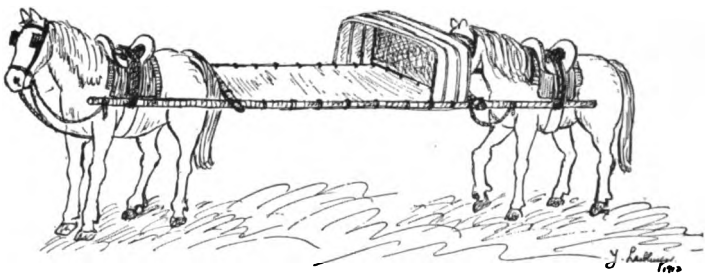

FIG. 4.
Extemporized horse litter. [*From a drawing by Hartsuff.*]

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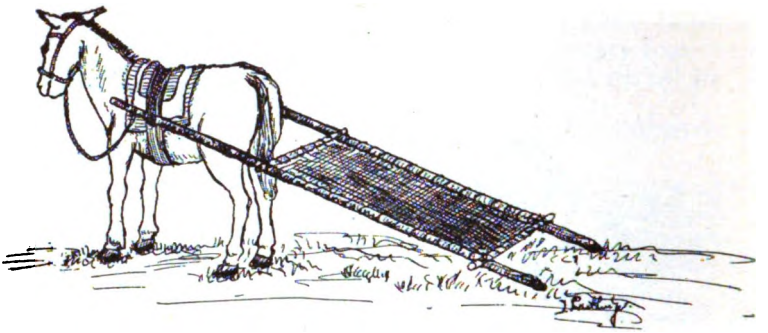

FIG. 5.
Extemporized travois. [*From a drawing by Hartsuff.*]

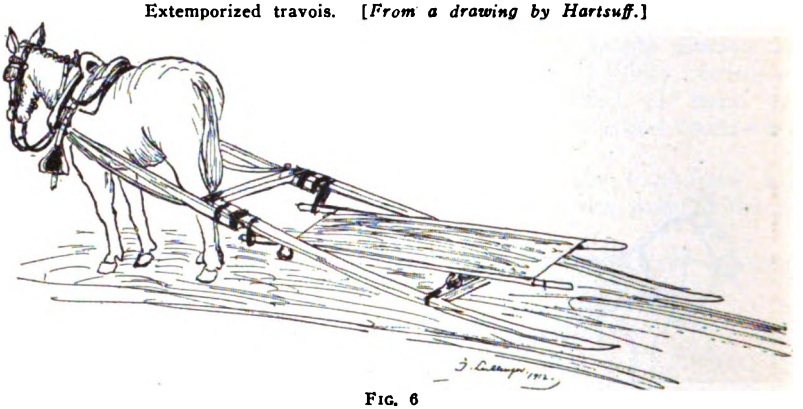

FIG. 6
Improved Greenleaf travois.

FIG. 7.
Picture of travois taken after march of 844 miles.

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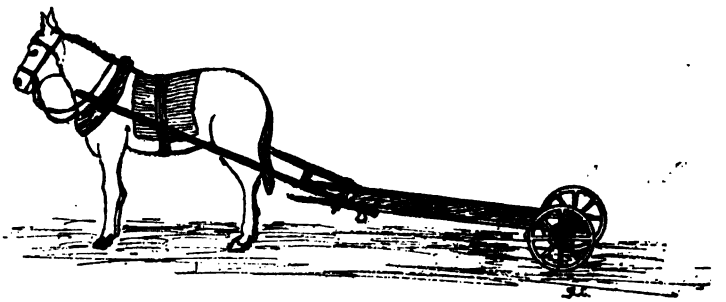

FIG. 8.
Wheel litter travois.

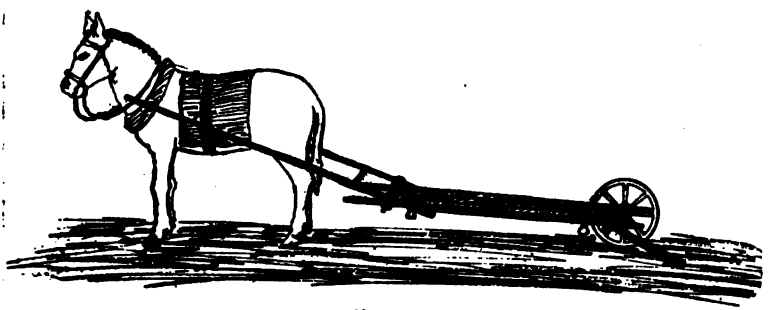

FIG. 9.
Wheel litter travois with one wheel broken and a sapling used in its place as a drag.

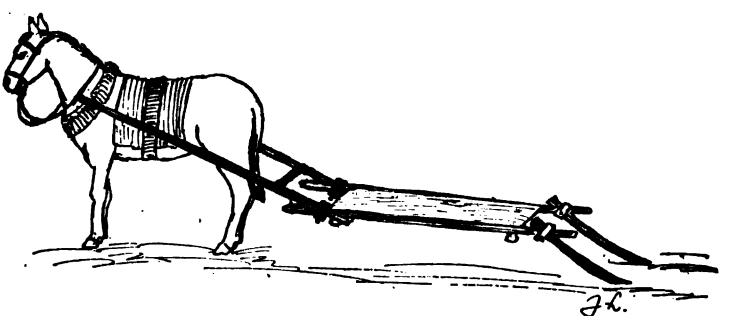

FIG. 10.
A wheel litter travois with both wheels replaced by saplings.

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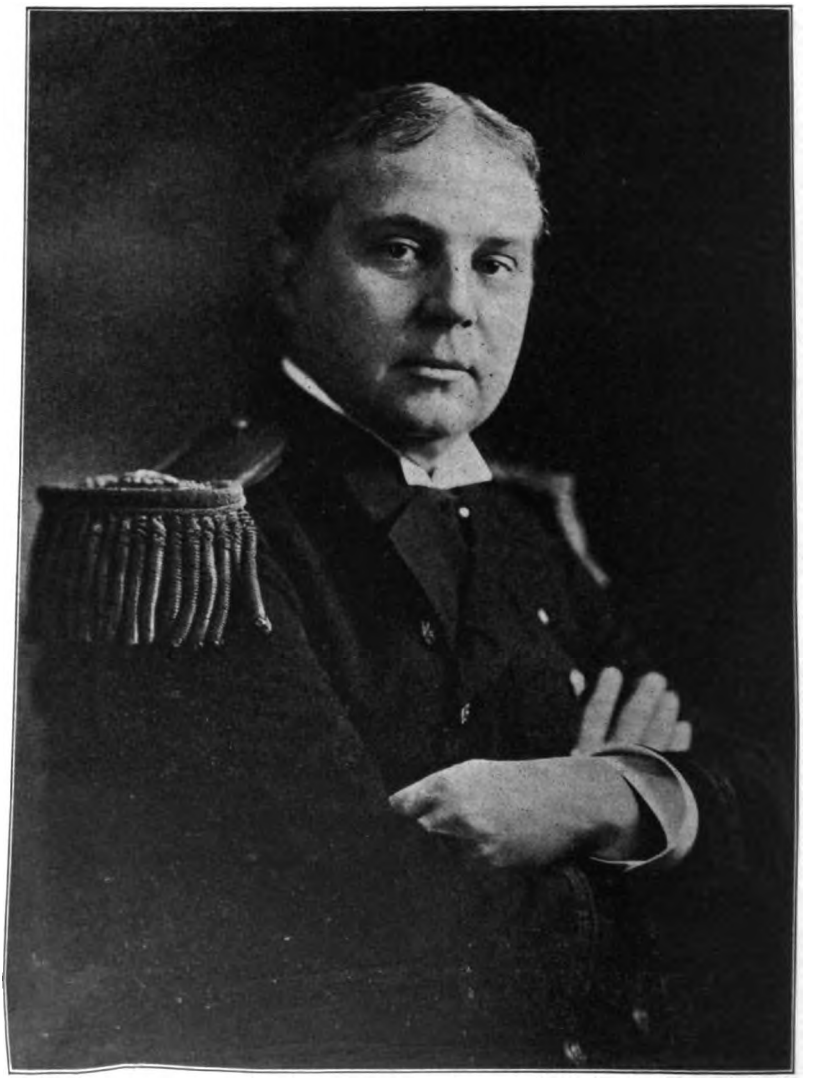
NEW OFFICERS OF THE ASSOCIATION.

SURGEON W. C. BRAISTED, U. S. N., who was elected President of the Association at the Twenty-first Annual Meeting, is one of the best known medical officers of our Navy.



SURGEON W. C. BRAISTED, U. S. N., PRESIDENT.

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A brief summary of his life follows:

Native—Toledo, Ohio.

Born—October 9, 1864.

Graduate University of Michigan, 1883, with degree of Ph.B.

Graduate Columbia University, New York, Medical Department, Class of 1886; was an honor man.

Served two and one-half years in Bellevue Hospital, New York.

Practiced medicine Detroit, Mich., 1888-1890. Was assistant to Neurologist at Harper's Hospital. Attending Surgeon for Jenks Sanitarium for Women, was appointed visiting Physician to the Woman's Hospital of Detroit.

1890. Entered the Navy as Assistant Surgeon; has been promoted to Passed Assistant Surgeon and Surgeon; will soon be a candidate for promotion to the grade of Medical Inspector, U. S. Navy.

Has served on many Naval vessels—the Vesuvius, Columbia, Ohio, Detroit, Topeka, Massachusetts, Connecticut—and at many Naval Hospitals.

Has twice been instructor in Surgery in the Naval Medical School.

Was decorated for caring for the wounded at the battle of Puerto Cabello, by the President of Venezuela.

Fitted out and equipped for service the Hospital Ship Relief.

Was sent to Japan to represent the Medical Department during the Russo-Japanese war. His report on this work was printed by Congress and by the Navy Department for distribution and was said by the Japanese to be the most accurate and complete published at the time. For this work Dr. Braisted was decorated by the Emperor of Japan.

Dr. Braisted was appointed Assistant Chief of Bureau of Medicine and Surgery with Surgeon General Rixey and reappointed by Surgeon General Stokes. He served as Assistant Chief of Bureau about six years and during that time originated and took part in the most extensive reorganization of the Bureau and the Medical Service of the Navy.

He served for one year with Dr. Rixey as attending physician to the White House during the time of President Roosevelt, and on July 1st, 1912, was detailed as Fleet Surgeon of the Atlantic Fleet, which position he now holds.

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SURGEON GENERAL RUPERT BLUE, U. S. P. H. S., the new Third Vice President, was born in Richmond County, N. C., May 30, 1867, his parents moving shortly afterward to Marion, S. C. He was educated in the public and private schools, and attended the University of Virginia in 1889 and 1890. He graduated from the University of Maryland with the degree of M. D. in 1892, and received the degree of Doctor of Science from that institution in 1908. He graduated from the London School of Tropical Medicine in 1910.

He entered the Marine Hospital Service as interne in 1892; passed the examination for Assistant Surgeon in 1893; was promoted to the grade of Passed Assistant Surgeon in 1897, and to that of Surgeon in 1909. Dr. Blue was appointed Surgeon General of the Public Health and Marine Hospital Service January

SURGEON GENERAL RUPERT BLUE, U. S. P. H. S., THIRD VICE PRESIDENT.

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11, 1912. He has served as an officer of the service at Cincinnati, Galveston, Charleston, S. C., San Francisco, Portland, Ore., Milwaukee, Genoa, Italy, New York, Norfolk, Va., and New Orleans.

Dr. Blue had charge of the operations in the eradication of bubonic plague in San Francisco in 1903-04. He served through the epidemic of yellow fever in New Orleans in 1905, and was Director of Sanitation of the Jamestown Exposition until September, 1907, when he was detailed to take charge of operations against another outbreak of plague in San Francisco, remaining there until January, 1910. In that year he represented the Public Health and Marine Hospital Service at the International Congress on Medicine and Hygiene at Buenos Ayres, later making extensive sanitary surveys in South America and Europe for the United States Government. Upon the completion of this duty, he returned to San Francisco to continue anti-plague work.

In November, 1911, he was detailed as special sanitary adviser to the Governor and Territorial Board of Health of Hawaii in carrying out a program inaugurated to make sanitary conditions such as to minimize the possibility of the introduction of yellow fever and plague into that territory after the opening of the Panama Canal. This was his last detail prior to his appointment as Surgeon General.

Dr. Blue is a member of the American Medical Association; honorary member of the Medical Society of the City and County of San Francisco; honorary member of the Academy of Medicine of California; member of the American Society of Tropical Medicine; the Royal Institute of Hygiene; the Board of Visitors, Government Hospital for the Insane. Washington, D. C.; and Executive Committee, Fifteenth International Congress on Hygiene and Demography.

MAJOR SAMUEL CECIL STANTON, Medical Corps, National Guard of Illinois, Secretary to the Surgeon General of that state and First Lieutenant, Medical Reserve Corps, U. S. Army, the newly elected Secretary of the Association, was born at Newtonville, Massachusetts, June 28, 1856, the son of Samuel and Ann Louise (Blodgett) Stanton. He attended the grammar school of Manchester, N. H.

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Major Stanton went to England in 1866 and was there a student at the City of London School until 1870. In 1872, after a tour of Continental travel, he returned to the United States and

MAJOR S. C. STANTON, N. G. ILL., SECRETARY.

entered the University of Illinois, Champaign. In 1875 he was obliged to leave college on account of ill health and return to

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England. After two years he came back to the United States and after a winter's study of medicine in Manchester, N. H., returned to the University of Illinois and finished a course, graduating from the school of chemistry with the degree of B. Sc. in 1879. After a post-graduate course, he resumed medical study in Chicago in April, 1880, but after two years was obliged to return to England to take charge of the business of his father, who was ill. This necessitated his remaining in England for five years, after which he returned to the United States in 1887 as agent of the Passenger Department of the St. Paul, Minneapolis and Manitoba Railroad. In 1889 he resumed his medical studies and was graduated from the Northwestern University Medical School (Chicago Medical College) in 1892. Since that time he has been a practitioner in Chicago.

Military Service.—Served as Private, Sergeant, Right General Guide, Lieutenant and Captain, Cadet Battalion, University of Illinois, with honorary commission as Captain in 1879. In 1880 enlisted in First Infantry, Illinois National Guard, as Private. In 1881 was made Hospital Steward of the Regiment and was honorably discharged on account of leaving the United States. In 1889 re-enlisted in the same regiment as Private and served for about three years.

In 1897 was commissioned First Lieutenant and Assistant Surgeon, Illinois National Guard, and assigned to Second Infantry, and three months later was transferred to the First Infantry, in which he served as First Lieutenant and Assistant Surgeon, Captain and Assistant Surgeon and Major and Surgeon continuously until 1909, when he was transferred and recommissioned as Major, Medical Corps, Illinois National Guard, Secretary to the Surgeon General, a position which he still holds.

He was commissioned First Lieutenant, Medical Reserve Corps, U. S. Army, in July, 1907. During the Spanish-American War he served as Attending Surgeon, Headquarters Department of the Lakes, Chicago, and since then for more than four years at various times has filled the same position.

Society Membership.—American Medical Association, Association Military Surgeons of United States (Chairman of Committee on Necrology for several years, and elected Secretary and Editor of MILITARY SURGEON in 1912); Mississippi

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Valley Medical Association (Treasurer for 9 years); Illinois State Medical Society; Chicago Medical Society; American Academy of Medicine; Chicago Physicians' Club, etc.

Literary Work.—From 1880 to 1882 Assistant Editor of the *Chicago Medical Gazette* and *Chicago Medical Review.* In 1891, Assistant Editor, *Chicago Medical Recorder.* 1893 to 1897, Editor, *Medical Standard,* and since 1900 a member of the Editorial Staff of the *Journal of the American Medical Association.*

Contributions to literature; occasional articles read before medical societies and

"The Recruit," read before the Association of Military Surgeons of the United States at its Washington meeting, 1901.

"Prophylaxis of Tetanus," read before the Mississippi Valley Medical Association in 1907.

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CURRENT LITERATURE

Titles marked with an asterisk (*) are abstracted below.

FRANCE.

Archives de Médecine et de Pharmacie Militaires.

September, 1912.

1 A General Medical Inspection in Morocco in 1908 (Conclusion). Delorme.
2 Acute Adrenal Insufficiency Due to Capsular Hemorrhage. Blanc and Xambeu.
3 On a Case of Pneumococcus Parotitis. Esprit and Brette.
4 Diaphragmatic Strangulated Hernia. Cochois.
5 Milk Powder in the Sanitary Arrangements in Morocco. Pellerin.

October, 1912.

6 Special Report of the Bureau of Military Hygiene of Limoges.
7 Generalized and Suffocating Subcutaneous Emphysema. Frilet and Revel.
8 Operative Cure of a Case of Hypospadias. Gary.
9 Tubercular Meningitis Diagnosed as Cerebrospinal. Thollos.
10 Apropos the Flannel Binder. Arnould.
11 Accidents in Firing Against Hail Storms. Romary.
12 Report of the Second Medico Legal Congress of the French Speaking Countries. Simonin.

H. J. NICHOLS.

Archives de Médecine et Pharmacie Navales.

August, 1912.

13 Aeration and Ventilation on Board the Cruiser Sclebon. Dr. Duranton.
14 New Formula for the Preparation of the Symp. of Lacto-phosphate of Lime. M. A. Saint-Service.
15 Epidemiology—Asiatic Cholera in the Navy at Toulon in November, 1911. M. Oline and Colombe.
16 A Case of Septicemic Plague on Board the D'Iberville. Dr. Lepeuple.

September, 1912.

17 Reaction of, Wassermann. Dr. Tribondeau.
18 Iodized Peptone. Dr. Janneau.

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19 Asiatic Cholera in the Navy, November, 1911.
20 Analytical Review.
21 The Sanitary Service of the Navy, in the Italian-Turkish War. Dr. Santelli.
22 *The Treatment of Burns. Dr. Santelli.
23 The Diseases of the Toilers of the Sea. Dr. Vitali.

22. **The Treatment of Burns.**—This article is a review by Dr. Santelli from one of Dr. Rho in *"Annali de Medicine Navale,"* 1911. "The celebrated 'Oleo-Calcaire' (Carron-oil), also wet local applications and baths, are useless against suppuration, and were abandoned on the arrival of antiseptics, but we fell then into another error; the toxic antiseptics, or simple irritants, such as sublimate, and iodoform, have been employed too largely. Then came the vogue of less irritating antiseptics, such as salicylic acid, salol and picric acid; later came the use of inert powders, such as bismuth. Picric acid has had its vogue, but it has shown no efficacy, except in burns of the first degree. It is too irritating for those of greater degree. Then came the turn of dry applications, especially in Germany; but all dry powders, notably bismuth, are objectionable, as they form crusts, under which suppuration and further infection proceeds. Now we have returned to topical anodynes in a protective fatty medium, of which vaseline is the best, as it does not become rancid." The writer enlarges on the method of Lucas-Champonnière, based on the known sanitary property of essences, of which he employs those of thyme, geranium, vervain and origanum, which are used in a vaseline vehicle. A formula of pure vaseline 100 gms., boric acid 10 gms., balsam of Peru 1 gm., seems the most practical.

In more profound lesions, with suppuration left after the separation of eschars, a liberal disinfection with oxygenated water is used. This method has been attended with success. Still another method is recommended, which, it is claimed, gives the best results, that is with tincture of iodine. Dr. A. Tolassoni uses this agent of a strength of 2%. He cites the case of a patient having symmetrical burns on the forearm; one being treated by the iodine method, and the other in the usual way. The application of the iodine produced a very painful sensation, but of short duration, followed by one of comfort, and the process of repair was much more rapid on the members with the iodine dressing.

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In view of the grave lesions, involving so much of the dermal covering, of so much more common occurrence in these times of high explosives, these later methods deserve the attention of and a careful trial by the Medical Department.

JOHN C. WISE.

GERMANY.

Deutsche Militärärztliche Zeitschrift.

September 5, 1912.

24 On Our Knowledge of Spastic Aphonia. Zumsteeg.
25 A Discovery of a Military Surgical Instrument of Antiquity. W. Haberling.
26 Fitness for Service and Epilepsy. Heilig.
27 My Iodine Tincture Flask for Grossich's Method of Disinfection. Scheel.
28 A Simple Arrangement for Taking X-rays in Standing Patients. Schnalm.
29 Medical Notes on the Regulations for Garrison Buildings. Georg Schmidt.

September 20, 1912.

30 The Destruction of Insects in Military Buildings by Salforkose. Bischoff.
31 Pension Regulations of March 16, 1912, for the Prussian Army. Martineck.
32 On the Question of the Value of Punishment in Relation to Fitness for Service. Partenheimer.

October 5, 1912.

33 The Medical Service in the Swiss Army. Dreist.
34 On Medical Service with the Cavalry. V. Reitz.
35 The Psychopathic Form of Heat Stroke and Noteworthy Cases. A. Hiller.
36 Percussion of the Apices of the Lungs. Hammerschmidt.

October 20, 1912.

37 The Care of the Teeth in the Army. Tüshaus.
38 Hydrocele and Trauma. Graf.
39 The Applicability of Direct X-ray Examination in the Field. Viktor Hufnagel.
40 A Still Simpler Treatment of Scabies With Sulphur. Has.
41 Transportation by Bicycles. Driest.

H. J. NICHOLS.

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GREAT BRITAIN.

Journal of the Royal Army Medical Corps.

October, 1912.

42 Preliminary Note on Immunization Against B. Paratyphosus A. Major S. L. Cummins and Major C. C. Cumming, R. A. M. C.
43 The Treatment of Gonorrhoea and Some of Its Complications. Major L. W. Harrison and Lieut. C. H. H. Harold, R. A. M. C.
44 The Philosophy of Our Aryan Brother. Colonel R. H. Firth, R. A. M. C.
45 Water-Bottles and Mess-Tins. Captain N. Dunbar Walker, R. A. M. C.
46 Sunstroke—A Heresy. Major W. H. Ogilvie, I. M. S.
47 Sand-Flies and Sand-Fly Fever on the Northwest Frontier of India. Colonel S. C. B. Robinson and Major R. J. Blackham, R. A. M. C.
48 Clinical and Other Notes.
49 *The Organization of Different Armies for the Removal of Wounded from the Battlefield. Colonel W. G. Macpherson, C. M. G., K. H. P.

49. **Removal of Wounded from the Battlefield.**—The author states that "The removal of sick and wounded during military operations, although it has only during the last two or three years become in the British Army a matter with which the general and administrative staff officer has to be more or less acquainted, has long been a subject of study in Continental countries, more especially in Austria. Austria, during the wars of the 18th century, was fortunate in having a monarch, Joseph II, who had direct personal knowledge of war, and who saw for himself the neglect and distress that was being caused by the system then generally adopted of treating the sick and wounded as near their regiments as possible.

"The experience of the war of the Bavarian Succession and previous wars showed how greatly armies were hampered by retaining with them, or in their neighborhood, sick and wounded who required prolonged treatment; and it was under Joseph II's influence that the principle of basing field medical organization on a system of evacuation of wounded was first enunciated. The organization he adopted was that of a series of mobile and other hospitals, along a long line of evacuation, in order to remove such cases as far as possible from the zone of hostilities, and give them at the same time opportunities of treatment under conditions free from anxiety and disturbance.

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"It was long, however, before other countries learned these lessons, although during the Napoleonic wars the Austrian Contingent became famous for the skill and care with which arrangements for evacuation of its sick and wounded were carried out. The Austrian organization for dealing with masses of wounded and evacuating them to fixed hospitals attracted the attention of the Commanders of the Prussian and Russian armies during the War of Liberation, and after the battle of Leipzig they sent their Principal Medical Officers to study and imitate it."

"We, ourselves, have been particularly slow in grasping these ideas, chiefly because we have never in modern times had to deal with large masses of wounded. As an instance of our failure to grasp these principles, I might point out the organization of the Territorial Forces, where no provision in the original scheme was made for the evacuation of wounded. Field ambulances were well organized and a scheme for providing general hospitals in different parts of the country was put on paper; but no provision was made in the first instance for bringing the wounded from the field ambulances to the general hospitals. I understand that the reason for leaving out the essential links in the system of evacuation in England was that the idea prevailed that the wounded would be taken over from the field ambulances by the various townspeople and villagers in the neighborhood, leaving their removal from there to the general hospitals a matter of chance, or haphazard organization whenever the need or opportunity arose. This, however, would have created exactly the same situation which led Austria in the 18th century to think seriously of the necessity of adopting a complete system of evacuation. If matters were to remain in our Territorial Force as had originally been intended, we would have the same historical experience as the Austrians had then, should the Territorial Force ever be engaged in actual war."

The author then speaks at length of the British experience in South Africa, the Russian experience in the Crimean War, that of the Austrians at the battlte of Koniggratz in 1866, and that of the Japanese in the Russo-Japanese War. He then discusses at length the organizations for the evacuation of wounded of the British and of Continental Armies.

ALBERT G. LOVE.

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RUSSIA.

Wojenno Medicinskij Journal.

March, 1912.

50 *Two Cases of Transplantation of the Ureters Into the Rectum. A. M. Ostrjanski.

51 A Case of Suppurative Peritonitis Following Trauma of the Bowel Without Solution of Continuity of the Abdominal Wall. W. P. Djedow.

52 *The Problem of Preparation of the Operative Field. A. Th. Berdjajew.

53 The Teeth of Soldiers of the St. Petersburg Garrison. M. N. Kokushin.

54 Clinics at London and Edinburgh (Concluded). M. S. Astwatsaturow.

55 The Problem of Responsibility in Military Crimes. T. D. Thaddejew.

56 Military Hygiene at the International Hygienic Exposition at Dresden, 1911. K. W. Karaffa-Korbutt.

57 Relations of Weight, Height and Chest Circumference of Man. S. J. Alfejew.

50. **Ureteral Transplantation.**—Surgeons who are called upon to consider relief for incurable diseases of the bladder will hail with delight the tremendous efforts made by a comparatively young Russian colleague, Mirotworzeff, assistant of Prof. Oppel, of St. Petersburg, to devise a new method of transplanting the ureters into the bowel, which, to judge from the collected material, promises to show results far superior to even the ingenious Maydl operation. For the benefit of such readers of THE MILITARY SURGEON who may not be entirely familiar with Mirotworzeff-Oppel's labors, the abstracter takes the liberty of stating that in cases in which the bladder is either incurably diseased (tuberculosis, carcinoma, etc.), or hopelessly deformed (high epispadias, exstrophy, etc., producing incontinence of the urinary flow), exclusion of the bladder with or without extirpation of that viscus must necessarily prove a veritable godsend to the poor sufferers. As is well known, conversion of the rectum into a bladder (i. e., if the anal sphineter functions normally) by transplanting the ureter or ureters into the bowel immediately below the sigmoid is preferable to external ureterostomy with artificial urinary receptacles. Maydl's operation, the best so far devised, means simply the transplantation of a piece of bladder containing the ureteral orifices. All modifications of that operation have

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neither added to nor detracted from the glory of Maydl. The only trouble with that operation, as the abstracter believes, was that transplantation of a cystitic or diseased piece of he bladder—and who can be sure of normal tissue from mere inspection and palpation?—was fraught with dangers, both to the graft and to the patient. Mirotworzeff cut the ureters close to the bladder and after sufficient separation from their connective tissue beds, sutures them into the bowel much in the same manner as a catheter is sutured to the stomach in Witzel's gastrostomy. The danger from ascending infection can be overcome by certain preparatory and post-operative measures. Readers interested in this operation may address the abstracter, who will gladly assist in securing all possible data.

The number of ureteral transplantations, so far performed, is small, and the two cases reported by Ostrjanski are, therefore, of great surgical interest.

The first is that of a young official (19 years), who suffered from a trauma with the result that the urethra was torn from the bladder or rather the bladder from the urethra. This diagnosis was confirmed by catheter as well as through the fact that the os pubis was fractured. Surgical efforts proving in vain, transplantation had to be performed as a life-saving measure. Excellent functional result. Recovery. The second case was that of an elderly man (57 years old), who suffered from a never-ceasing dysuria and tenesnus due to papillomatous growths of the bladder. Recovery.

52. **Surgical Preparation of the Operative Field** was studied by B. in the past two years on 1,116 operations. With slight modifications he has followed Grossich's teachings, and has achieved excellent results (e. g., primary, clean healing in appendicectomy 100%; in hernias (42), 97.6%. His silk for ligatures and sutures is prepared in iodine solution. The author believes that Grossich's method fixes the bacteria in the skin, and that this method, from a practical and bacteriological standpoint, is to be preferred to the bactericidal methods of Fuerbringer, Ahlfeld, etc., which cannot possibly destroy the flora of the human skin.

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April, 1912.

58 A Case of Tuberculosis of the Intestines and Mesenteric Glands Producing Intestinal Obstruction. Operation. Recovery. W. P. Djedow,
59 Injection of Paraffin to Secure Release from Military Service and the Fate of Paraffin in the Human Organism. P. O. Kolchin.
60 Artificial Hernias. T. S. Glickman.
61 Electrocardiogramme and Pharmocologic Agents of the Group Digitalin and Digitoxin. W. Th. Zelenin.
62 Reply to Lebedew's article: "Distribution of Tuberculosis Among the Troops of the Warsaw and Petersburg Military Districts." N. N. Zakharow.
63 Military Hygiene at the International Hygienic Exposition at Dresden, 1911 (Concluded). K. W. Karaffa-Korbutt.
64 Disinfecting Capacity of Zillin. P. W. Andropow.
65 "Canned" Meat and Its Production in Russia During the Russo-Japanese War. S. A. Kissel.
66 Cases of Lichen Ruber Planus Diffusus et Corneus. A. M. Tujjenko.
67 Plastic of the External Auditory Canal. A. W. Krujilin.

May, 1912.

68 Centripetal Nerves of the Arteries. P. J. Kaufman.
69 *Artificial Hernias (Concluded). T. S. Glickman.
70 *The Problem of Mutilation of the Sexual Organs. W. S. Kaminitz.
71 The Treatment of Furuncles by a Collodion Ring. N. M. Smirnow.
72 Tabes (Ataxic) and the Treatment of Parasyphilis of the Nervous System by Mercury and Salvarsan. S. S. Tshirjew.
73 "Canned" Meat and Its Production in Russia During the Russo-Japanese War (Continued). S. A. Kissel.
74 Data Concerning the Influence of Camp Life on the Weight of Soldiers. M. S. Gussew.
75 *A New Model of Field Litter. L. L. Klinski.
76 Blepharoplasty by Transplantation of Freed Skin Flaps. B. M. Effimow.
77 The Principle of a Photometroscopic Appliance for Exposure of Feigned Blindness of one eye. A. Th. Bekman.

69. **Artificial Hernias.**— Military service in Russia is not popular, especially with that part of the population which is not considered "pure Russian" by the government. This is evidenced by large numbers of young men resorting to all sorts of methods of self-mutilation, inflicted, usually, by "feldshers" for a consideration. The abstracter, when a young student, had occasion, during a brief sojourn in Lithuania, to observe one of these unscrupulous fellows ready to amputate fingers or to produce such

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mutilations likely to incapacitate the "patient" for military service. Inserting a hermiotome into the inguinal canal and making a few "slashes" usually resulted in the production of acute inflammation, which was hailed with delight as evidence of success in spite of the resulting intense pains. Glickman cites many such cases and describes the scar-like tissue found on operative investigation.

70. **Self-Mutilation of the Sexual Organs,** as reviewed and illustrated by an interesting case by K., only serves to confirm what has been said in the preceding abstract. The patient, a Russian native, is a graduate doctor of chemistry of the University Lausanne, and was assigned to a Hussar regiment. A swelling in the testicle disqualified him from horseback riding. Sent to the military hospital, he gave a history of having been thrown from a street-car several years ago, which trauma was followed by a hydrocele, swelling and fistula. He claims to have been operated on by an Austrian surgeon (now dead). Indeed there was a fistula and ill-defined hard tumor close to the epididymus. The patient refused probing the fistula. Hot applications "softened" the tumor into a paste-like consistency. Finally a preliminary operation was permitted and all sorts of shreds of textile material were expelled. Serious infection forced the patient to ask for a radical operation, which was successfully done. The patient maintained that the foreign material had been introduced therapeutically to produce cicatrization of the hydrocele sac.

Now, self-mutilation was plain enough, but the fact remains that foreign bodies (silk, carbolized catgut strands) although now rejected, have been historical therapeutic agents. As the court could take cognizance of that and, remembering the humanness of the military surgeon's calling, the official report was so framed as not to expose the soldier-chemist to court-martial.

75. **A New Field-Litter.**—Glinski's litter was exhibited at the recent International Red Cross Conference Exhibit held at Washington, D. C., and was awarded a prize of $500 by the jury. The author, in describing his new litter, mentions nearly 20 authors of other litters, recites the deficiencies of the official Russian Army litter, and claims that none extant fulfill military demands, "because the tremendous numbers of wounded on the

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battlefield" have not been taken into consideration. Without entering into details of Glinski's construction—a framework of wooden sticks held apart and covered by a piece of ducking, with an attachment for a head rest—one cannot help but question how any construction could possibly overcome the difficulties produced by the large number of wounded. Even the most inexpensive, simplest, most convenient and ingenuous litter without wheels requires two to four bearers and the problem is not the expense or construction of the ordinary stretcher, but the number of bearers. Glinski's litter, in the abstracter's opinion, does not differ much from the litters used by the German Red Cross sanitary columns, which, too, cannot be said to approach the ideal. A critical discussion of this problem, editorially, appeared in the September number of THE MILITARY SURGEON, to which the reader is referred.

G. M. BLECH.

MUCH has been said and written about the struggle of the medical corps of the Russian Army to secure a military status for its officers accorded officers of the line. That there has been progress made in spite of much opposition by line generals who have held and still hold high offices in the sanitary service is well known.

That high tribute is being and always will be paid to earnest devotion of duty, irrespective of technical quibbles over status, rank or insignia of office, is exemplified by the following instance:

On April 26 (Russian calendar), died a young army physician by name Anatole Okintshitz. He was but thirty years old and has been in the army but three years. Practically from the first day of his appointment he was called upon to combat typhoid epidemics in his regimental hospital. He not only threw his whole soul into his work, but utilized the presenting opportunities for special research. Though undermined in health he met lately a typhus and small-pox epidemic, and in spite of an unsuccessful revaccination contracted smallpox and died a martyr to his profession and duty.

Lieutenant-General Petroff, commander of the garrison, ordered an escort of a company to be in charge of not less than two

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commissioned officers and a military band as a funeral escort with instruction to fire the usual salute over the grave.

Dr. Platonow, senior surgeon of the Ekaterinoslaw disciplinary battalion, published a touching tribute to the deceased in the September issue of the *Military Medical Journal* of St. Petersburg, and the editorial department did not object to giving the young deceased worker two full valuable pages. Indeed, here as elsewhere, your correspondent is reminded of the old dictum: *Palman qui meruit ferat!*

G. M. BLECH.

SPAIN.

Revista de Sanidad Militar.

September 1, 1912.

78 The Ninth International Conference of the Red Cross in Washington (to be concluded). J. Potous.

79 *Paraplegia Following a Gunshot Wound; Cured by Craniectomy. Francisco Lugue.

September 15, 1912.

80 Data Collected from the Examination of the Nasal Fassae of the 1,426 Skulls. Dr. A. Ramirez Santalo.

81 The Ninth International Conference of the Red Cross in Washington (Conclusion). J. Potous.

82 Treatment of Wounds; Application of Antistreptococcic Serum. Federico Gil Acebedo.

83 The Importance of the Rapid Analysis of the Gastric Juice in Wounds of the Stomach and Intestines. L. Serrada.

79. **Paraplegia Following Gunshot Wound.**—The author describes the case of a soldier who was shot through the head by a bullet of small caliber, the wound of entrance being in front of the parietal eminence on the left side and the wound of exit at the parietal eminence on the right side. The patient did not lose consciousness at any time and examination on the day following the injury showed the pupillary reflexes normal and patellar reflexes somewhat exaggerated; taste, smell and hearing normal; general sensation normal. Patient was entirely unable to move legs and right arm, and could move left arm with difficulty. The next day he regained use of his arms, but remained paralyzed

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below the waist. A radiograph showed a small piece of the projectile remaining in the cranial cavity near the vertex and to the left of the median line. On the twelfth day after the injury the patient was operated upon. The inner table and some splinters of bone, together with a blood clot, were pressing upon the areas surrounding the fissure of Rolando on both sides. These were removed and hemorrhage from a small wound in the superior longitudinal sinus stopped by pressure. The patient made an excellent recovery, completely regaining the use of his legs.

A. C. CHRISTIE.

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REVIEWS

A TREATISE ON PELLAGRA. For the General Practitioner. By Edward Jenner Wood, S. B., M. D., Chairman of the Pellagra Commission, North Carolina Board of Health; Member of the American Society of Tropical Medicine; Fellow of the London Society of Tropical Medicine and Hygiene; formerly President of the Medical Society of North Carolina, etc. Octavo of 377 pages. With 38 illustrations in text. New York and London: D. Appleton and Company; 1912. Price $4.00.

This is an exhaustive treatise. The chapter headings are as follows: History and geographical distribution; theories of etiology; general characteristics of the disease; skin manifestations; the digestive disturbances; nervous and mental changes in pellagra; diagnosis; prognosis; prophylaxis; and treatment.

The author has evidently made a very careful study of the literature of pellagra and this has been freely abstracted with his own statements, opinions and comments. Of course, the great interest in this disease lies in its etiology. Doctor Wood is evidently so opposed to the maize theory that he is intolerant on this subject. He, himself, while stating at the beginning of the chapter on etiology that the cause of pellagra is unknown and that the whole subject is in more uncertainty now than ever before, announces later that he feels confident we are dealing with a parasitic disease though he is by no means satisfied the simulium is the particular intermediate host in the transmission.

The book as a whole represents a successful attempt to increase our knowledge on a difficult and puzzling subject. It is a pleasure to see that the author has appreciated the labors of the Public Health Service in respect to pellagra and that he acknowledges the great importance of this service as a conservator of public health. In this acknowledgment appreciation is also expressed of the value of the Surgeon General's Library. Nothing is said to show which Surgeon General is meant, but as mention is made that this is the greatest medical library in the world, it is evident to those informed on the subject that the reference is to the

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library of the Surgeon General of the Army. This particular instance of confusion in the public and even the scientific mind on the subject at issue is, of course, not of great importance, but it is one more fact which goes to show that it is not desirable to have a multiplicity of Surgeons General.

A TEXT-BOOK OF PRACTICAL THERAPEUTICS. With especial reference to the application of remedial measures to disease and their employment upon a rational basis. By Hobart Amory Hare, M. D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia. Fourteenth edition, thoroughly revised. Octavo, 984 pages, with 131 engravings, and 8 full-page colored plates. Cloth, $4.00, net. New York and Philadelphia: Lea & Febiger; 1912.

This standard work is known favorably to the vast majority of our readers. When the first edition appeared some twenty-two years ago it was warmly welcomed by the medical profession as it marked a distinct advance. Before this, books of this character were so choked with dry materia medica and laboratory findings that the student was quite at a loss how to make use of them practically in the treatment of disease. The present author has overcome these objections, and important scientific facts are linked together with the actual administration of drugs to the patient. The form of the book has been little changed in the later editions. Part I is devoted to general therapeutical considerations; Part II, to drugs; Part III, to remedial measures other than drugs and feeding the sick; and Part IV, to treatment of diseases, table of doses of medicines, index of drugs and remedial measures, and index of diseases and remedies.

In the present edition the text has been thoroughly revised and much new matter has been introduced. Salvarsan, tuberculin, vaccine therapy and Bier's hyperæmia all find a place.

COLLECTED PAPERS BY THE STAFF OF ST. MARY'S HOSPITAL (MAYO CLINIC) FOR 1911. Octavo of 603 pages, illustrated. Philadelphia and London: W. B. Saunders Company; 1912. Cloth, $5.50 net.

All the papers read before medical societies or published by the members of the staff of St. Mary's Hospital during the year 1911 appear in the present volume. It is presumed that this practice will be followed year after year, and it is needless to say that these annual publications will be welcomed by surgeons throughout the world.

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The sections under which the subjects of the present volume are grouped are: alimentary canal; hernia; genito-urinary; ductless glands; thorax and extremities; technic; general papers and in memoriam. The last is to the memory of William Worrell Mayo, the father of William J. and Charles H. Mayo.

The present volume is no less instructive than those which have preceded it. As usual the publishers are to be congratulated on the illustrations and the letter-press.

NEW ASPECT OF DIABETES. Pathology and Treatment. By Prof. Dr. Carl von Noorden, Professor of the First Medical Clinic, Vienna. Lectures delivered at the New York Post-Graduate Medical School, New York. Octavo of 160 pages. New York: E. B. Treat & Company; 1912. Price $1.50.

This book comprises recent lectures delivered at the New York Post-Graduate Medical School, with one lecture given before the St. Louis Medical Society as late as September 30, 1912. As Professor von Noorden is universally regarded as an authority, it is evident that the lectures in question well express the best and most recent thought on the subjects of which they treat.

Dr. Ludwig Kast, as a representative of the New York Post-Graduate Medical School, has contributed a prefatory note for the book. A brief introduction precedes chapters as follows: The source of sugar; the rise in caloric production and its causes; the control of sugar formation and its disturbances, theory of diabetes; therapy of diabetes; and acetonuria, its influence on the treatment of diabetes mellitus.

SERUM DIAGNOSIS OF SYPHILIS AND LUETIN REACTION TOGETHER WITH THE BUTYRIC ACID TEST FOR SYPHILIS. By Hideyo Noguchi, M. D., M. Sc., Associate Member of the Rockefeller Institute for Medical Research, New York. Octavo of 306 pages, 23 illustrations, of which 17 are in color. Third Edition. Philadelphia & London: J. B. Lippincott Company. Price, $3.00.

That this book has proved extremely popular is shown by the demand for three editions within three years. The preceding editions have been favorably mentioned in these pages. The author speaks with the same weight of recognized authority in the present edition.

A chapter has been introduced on the question of distinguish-

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ing the Wassermann reaction from the specific complement-fixation. Further study on this subject has been possible through the successful cultivation of treponema pallidum on artificial medium. The writer states that by the establishment of the distinction mentioned above he hopes to develop a new phase of serum diagnosis in syphilis.

A chapter has also been added on the luetin reaction. No alteration has been found necessary in the technics since the last edition, but certain interesting facts revealed by Craig in his analysis of a large number of cases treated by Salvarsan have been incorporated.

A MANUAL OF AUSCULTATION AND PERCUSSION, EMBRACING THE PHYSICAL DIAGNOSIS OF DISEASES OF THE LUNGS AND HEART, AND OF THORACIC ANEURYISM, AND OF OTHER PARTS. By Austin Flint, M. D., LL.D., Late Professor of Medicine and of Clinical Medicine in the Bellevue Hospital Medical College, etc., New York. Revised by Haven Emerson, A. M., M. D., Associate in Physiology and in Medicine, College of Physicians and Surgeons, Columbia University, New York. 12mo, 361 pages, illustrated. Cloth, $2.00 net. Lea & Febiger, Philadelphia and New York; 1912.

The older editions of this valuable "Manual" are doubtless well and favorably known to the majority of the readers of this journal as is stated by Dr. Emerson. The principles, the methods, the limitations, the practical conclusions from the physical examination of the thoracic viscera have never been more clearly nor more effectively described in English. Dr. Flint also rejoiced in an elegance of style. This has been adhered to strictly in the revision. Additions to original chapters embrace new methods of examination which have proved to be of value in the last twenty-five years. New chapters have also been added giving methods of examination of the abdomen and of the nervous system.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume III. The Eye, Ear, Nose and Throat. Edited by Casey A. Wood, C. M., M. D., D. C. L.; Albert H. Andrews, M. D.; Gustavus P. Head, M. D. Series of

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1912. Octavo of 358 pages, illustrated. Chicago: The Year Book Publishers. Price of this volume, $1.25. Price of the series of ten volumes, $10.00.

In the introduction to this number attention is invited to the fact that the proportion of reading men in the medical profession is shamefully low and that it is not much better among those who style themselves ophthalmologists. This condition of affairs is deplored and it is certainly deplorable. A quotation is made from the pens of Edward Jackson and H. V. Würdemann, from which it appears that while fifty years ago the real specialists could be counted on one hand and twenty-five years later there were only a couple of hundred, now among the 142,070 doctors in America listed in the A. M. R. Directory, there are over 20,000 practicing the various specialties, and of these nearly 5,000 are more or less skilled in the diagnosis and treatment of eye, ear, nose and throat troubles, alone. In the writers' opinion, judging by the number of reading men, not more than one-fourth of these are actually qualified to practice their specialties. For specialists anxious to keep up with their specialties a volume like the present one should prove of great value, summarizing as it does all the current literature of most worth. If one is unable to read the various periodicals the most important advances recorded in volumes of this character will in large measure prevent him from falling behind the times.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume IV. Gynecology. Edited by Emilius C. Dudley, A. M., M. D., Professor of Gynecology, Northwestern University Medical School; Gynecologist to St. Luke's and Wesley Hospitals, Chicago, and C. von Bachellé, M. S., M. D., Assistant Professor of Obstetrics, Chicago Polyclinic and College of Physicians and Surgeons; Gynecologist to the German Hospital, Chicago. Series of 1912. Octavo of 228 pages, illustrated. Price of this volume, $1.25.

This number compares favorably with other volumes of this series. In some instances the editors have made critical comments. They announce that those articles which are not com-

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mented upon are presented subject only to the judgment of the reader. A few clear illustrations appear in this volume.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume V. Obstetrics. Edited by Joseph B. De Lee, A. M., M. D., Professor of Obstetrics, Northwestern University Medical School, with the collaboration of Herbert M. Stowe, M. D. Series of 1912. Octavo of 229 pages, illustrated. Price of this volume, $1.25.

The subject to which the present volume is devoted has been treated with the care always manifested in this series. As in the other volumes of the series, the present one is complete for the year preceding its publication.

THE PRACTICAL MEDICINE SERIES. Comprising Ten Volumes on the Year's Progress in Medicine and Surgery. Under the General Editorial Charge of Gustavus P. Head, M. D., Professor of Laryngology and Rhinology, Chicago Post-Graduate Medical School, and Charles L. Mix, A. M., M. D., Professor of Physical Diagnosis in the Northwestern University Medical School. Volume VI. General Medicine. Edited by Frank Billings, M. S., M. D., Head of the Medical Department and Dean of the Faculty of Rush Medical College, Chicago, and J. H. Salisbury, A. M., M. D., Professor of Medicine, Chicago Clinical School. Series of 1912. Octavo of 350 pages, illustrated. Price of this volume, $1.50.

The present volume of this standard series is an interesting one. The following subjects are discussed: Infectious diseases; diseases of the mouth and esophagus; diseases of the stomach and duodenum; diseases of the intestine; diseases of the liver; and diseases of the pancreas. In addition a miscellaneous section is devoted to paroxysmal hemoglobinuria, disease of the peritoneum and diseases of the abdomen. Under the heading infectious diseases much space is given to immunity and vaccine therapy. The subject, typhoid fever, also occupies much space. Here reference is made to the fact that the chief point of interest in connection with the advance of our knowledge of this disease is the wide and successful adoption of vaccines for its prevention. In discussing the etiology, however, due importance is not

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accorded to contact infection, which is all important from the military standpoint.

THE PRACTICE OF DENTISTRY. A practical treatise upon the general practice of dentistry, operative and prosthetic, exclusive of orthodontic practice. By Leo Greenbaum, M. D., D. D. S., formerly Dean and Professor of Clinical Dentistry, Materia Medica and Anesthesia, in the Philadelphia Dental College; and Max Greenbaum, D. D. S., formerly Quiz Master in the Philadelphia Dental College. Octavo of 836 pages, with 350 illustrations. New York and London: D. Appleton and Company, 1912. Price, $6.00.

The present work is designed to meet the need of the general dental practitioner for a book purporting to treat of the general practice of dentistry which the authors and publishers believe to exist. The book is intended for the experienced practitioner and not for the beginner in the study of dentistry.

The chapter of most interest to readers of this journal is naturally that on oral hygiene. This is well written, conservative and convincing. The other parts of the book apparently possess the same good qualities.

STORIES OF SOME SHOOTS; OR THE CHRONICLES OF A GRATIFIED GUNNER. By James A. Drain. Octavo of 114 pages. Copyright 1912 by Arms and The Man Publishing Co. Published May, 1912. Price, $1.25.

General Drain, in this small volume, has recorded interesting personal experiences stalking stags in Scotland and shooting pheasants and partridges in England and Scotland. We are sometimes, perhaps, rather contemptuous of methods of shooting pursued in those countries; this book should dispel misconceptions on that subject and show that game is killed there in a most sportsmanlike manner.

NEURASTHENIA SEXUALIS. A treatise on sexual impotence in men and in women. For physicians and students of medicine. By Bernard S. Talmey, M. D., former Pathologist to the Mothers' and Babies' Hospital, and Gynecologist to the Yorkville Hospital. Octavo of 196 pages. With 19 drawings in the text. The Practitioners' Publishing Company, New York. Price, $2.00.

The following chapters go to make up the book under review: Anatomy of the male genitals; anatomy of the female genitals; physiology of the male genitals; physiology of the female gen-

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itals; the sexual instinct; etiology of male impotence; etiology of female impotence; the pathology of male impotence; the pathology of female impotence; treatment of male impotence; treatment of female impotence; and prevention of excesses.

The author states in his preface that on account of numerous inquiries since his publication of a former book entitled "Woman" he decided to prepare this treatise on sexual disability in general.

The book is clearly written on subjects which are not often so plainly treated. It is most distinctly not adapted to general circulation, however, and it would seem that this being the case, it was wholly unnecessary to have introduced chapters on anatomy and physiology containing matter which is perfectly well known to every physician.

PRACTICAL MANUAL OF FIELD SURGERY (PRAKTITCHESKOJE RUKOWODSTWO PO WOJENNO—POLJEWOJ CHIRURGII). By Professor R. R. Wreden, late Chief Surgeon, Manchurian Army. St. Petersburg: Published by the Author. Octavo of 230 pages. Illustrated. Price not stated.

The above is not a manual. It is a bold, virile and at the same time very dignified essay. At least this is the best description that the reviewer, after having waded through the linguistic difficulties, can give. Indeed, the lack of knowledge of the Russian language was keenly felt by the writer, because, once begun, one could but wish one did not have to lay aside the work until completely read through. But with the necessity of frequent thumbing of the dictionary, this, to our regret, proved physically impossible.

We have been forced to designate the work an essay rather than a manual because it is all that the word implies and more. "Manual," or even "text-book," is not good enough.

The author is well known not only as a great operator and surgical teacher attached to the famous medico-military academy of St. Petersburg, but as a keen critic of surgical management in the field, and we were therefore very anxious to secure this work, which was dignified by no less a man than General Rapchewski with a review of many pages, and which received special recognition by the Russian general staff. And we were not disappointed. We have labored through the pages *con amore* and we have been rewarded.

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Let us glance at the work. There is an introductory of less than two pages. "All teachings about the humaneness of our modern armament are lies." The artillery projectiles, mines, covered pits, and even small-caliber arms, as far as their effects on the human body are concerned, "shatter into atoms the lies and the senseless prattle of the achievements of humanity in modern war." Whatever improvements in curative results have been obtained are due to the advances of surgery—and not to weapons. This is evidenced by surgical results in the gunshot wounds of peace, accidental, suicidal or homicidal, when no such a thing as humaneness is even considered. "In the field the complications and situations under which the demands of modern surgery can be carried out necessitate deviation from the pattern of peace-surgery, forming an independent science of its own."

The author, then, divides his book into three chapters: (1) frontal line, (2) nearest or strategic rear of the army, and (3) general rear. Only by such a division will the administration of surgical aid reach the desired height of efficiency.

Naturally, each chapter is subdivided into sections. From a military point of view the first is very important, if not the most important of the entire work. The Russo-Japanese war has shown a loss of 20% as against 10% when the armies had the old equipment. The "humane bullet" has doubled the number of victims. The ratio of dead to wounded, too, belies the "humaneness" (5% of all losses previously—20% of all losses now).

To illustrate what this means: An infantry division of 15,000 bayonets will yield a loss of 3,000 men. Of these 600 are killed and 2,400 wounded. As each division consists of four regiments, each of which establishes a dressing station, each will have about 600 wounded. Assuming that all five regimental surgeons will be at work, each has 120 wounded to look after. As each dressing requires five minutes of work, each surgeon has 10 hours' uninterrupted labor. Such was actually the case at Liaoyang, on the Sha river, and at Mukden. Result: every minute is precious and all operative intervention is out of the question, except as life-saving necessities. The main mission of the surgeon here is: *non nocere!* All demand aid, all are entitled to it. Pity for one means a hurt to ten others—and is, therefore, not mercy at all. First aid—that's all. Anything more, means loss

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of time robbed from the many. Wreden proceeds to discuss the material. He prefers an antiseptic to an aseptic first-aid packet. The author "narrates" the organization of stations, the selection of terrain, the transportation of wounded, the range of projectiles, without separating these subjects, as is usually done in manuals, into definite subdivisions. The danger to the litter-bearers, medical personnel and the wounded themselves at the frontal lines from the projectiles of the enemy causes the author to reject any plan to approach the wounded on the firing line.

Operative activity at all frontal aid-stations, even if protected by bomb-proof, is out of the question, because of the immensity of the material. The duties are: (1) prevention of infection, (2) arrest of hemorrhage, (3) treatment of traumatic shock, (4) immobilization of injured bones and joints, and (5) assortment and hurried evacuation to the main dressing station, formerly erroneously designated "the division lazaret" (for it has none of the characteristics of a lazaret), or, in its absence, to the nearest mobile field hospital. Tracheotomy and ligature of blood-vessels are the only two operations here permissible. As the surgeon must free the wounded from clothing over the wounded area, dress the latter, enter diagnosis tags and superintend the evacuation of the seriously wounded, asepsis of the surgeon's hands is difficult. The entire problem of asepsis is discussed. One thing is sure: Away with water! An alcoholic soap preparation is determined on—rubbed off before operating by a sterile piece of gauze. As regards hemorrhage—the simpler the method the better. Elastic constriction must be applied with care. As its too prolonged stay will destroy the extremity, all provisions should be made to caution the medical officers of the next étappe of its presence, to insure its prompt removal. For internal hemorrhages (brain, pleura, abdomen, etc.)—hypodermics of morphin, ergotin or adrenalin is all that can be done. Physiologic saline injections (subcutaneously only!) are essential in acute exsanguination. For shock —morphin (better than camphor, ether, nux, etc.). The author rejects for immobilization of bones and joints plaster-of-Paris casts as dirty and too time-consuming, and prefers splints of all sorts with starched bandages, which allow inscriptions with anilin pencils.

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The evacuation is important. The author divides the patients into gravely wounded, those unable to walk and those so able. Morphine will bridge over injured in the abdomen, who would otherwise succumb on the road. We learn for the first time that this classification is designated by color cards, agreed upon internationally. This is news to us. The subsequent divisions of the first chapter discuss in detail wounds of the head, neck, chest, abdomen, extremities and spine. The injuries are very briefly discussed with reference to first-aid and evacuation. A small section is devoted to the few instruments suturing (ligature) and dressing materials needed.

The main dressing point (station)—each division has one—supplements the regimental aid stations. Surgical activity here is possible under somewhat more agreeable conditions because (1) it is farther away from the firing line, and (2) because the wounded arriving here are already assorted with regard to gravity of the wounds. Although the field of sugical activity is broader here, it nevertheless must not exceed the character of imperativeness. Abdominal wounds must be treated conservatively because the post-operative rest, so badly needed, cannot be had. Gunshot wounds of the skull can be treated more radically. The hydro-dynamic effect of the missile is fatal up to 200 paces. Tangential shots from a greater distance offer a more favorable prognosis. Missiles piercing the skull are fatal even at 1,000 paces, because they shatter the skull into fragments. Here debridement in the areas of the entrance and exit to arrest hemorrhage and relieve compression is permissible. The unconscious patients do not need anesthesia. The technique is simple and described very plainly. The author thinks that one such station for each division is poor policy, for the division not infrequently extends to a front of 60 versts (40 miles). He criticises the lack of transport material at the disposal of such a station during the last war, which served to embarrass its function of communicating between the front and the field hospitals. Only well-trained surgeons should be placed here. All dressings should be sterile. Instruments are needed for skull operations, for bone operations—for all regions, in fact, except the abdomen. The battle ended—the main dressing point goes out of existence. Ambulances, wagons, two-wheel carts, railroad trains and field trains conclude the chapter.

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The nearest rear embraces not only the field hospitals, but also reserve hospitals along railroads. To these filter all wounded which can be cured in a month and such requiring urgent operations or otherwise unable to stand evacuation farther to the rear. The following subdivisions discuss all possible injuries and the technique of their operative treatment divided by regions. This same arrangement is repeated for the reserve hospitals, in which, however, such operations as rib-resections, arthrotomies, nephrotomies, and laminectomy predominate. The regular hospital trains are discussed in conclusion.

The hospitals of the general rear—forming the concluding third chapter of the work—come nearer the functions of "peace" (civil) hospitals. Here, with the aid of Rœntgenography and Rœntgenoscopy, much surgery of a facultative and deformity-preventing character is done. Region after region is thoroughly discussed.

Far be it from the reviewer to offer anything that would tend to indicate that he considers himself capable of criticising the distinguished author, who has had one of the best possible opportunities to study "traumatic epidemics" on a theater second to none in the history of modern warfare. But the reviewer cannot refrain from expressing his belief, in the light of the collective experience of many authoritative observers, that as no fast line can be drawn between all institutions in the rear of the regimental aid stations as regards surgical activity, the work would have been enhanced if one part had been devoted to general problems of organization, equipment, functions of stations and institutions, while the special part could have considered the diagnosis, treatment and management of all possible injuries, regionally, to be sure, and in relation to the tactical locality—a plan successfully carried out by von Oettingen (recently reviewed) and adopted by the reviewer in a monograph on military surgery, soon to see daylight.

The author merits the gratitude of all military surgeons!

G. M. B.

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EDITORIAL

A NUMBER of years ago a scheme contemplating the organization of one great medical school where officers of the Army, the Navy and the Public Health Service might all receive instruction commanded more or less attention. Nothing was done practically to put this plan into effect, however, and for a considerable time each of the regular medical establishments went its own way with, it may be remarked parenthetically, very successful results. In truth, nearly all who had interested themselves in the subject had pretty well abandoned all thought of the possibility of the proposed plan being successfully executed. Yet, at the last meeting of the Association of Military Surgeons, in the course of the discussion of affiliation between the Navy and the Public Health Service, it was brought out that the old scheme had some supporters. In fact, some officers present appeared to think that we might go much further than this to advantage. The most radical seemed to be inclined to believe that a plan might be worked out by which officers might serve alternately in the different regular medical establishments. Details in respect to the necessary arrangements to effect this end were not brought out, nor is it probable that any one had given them serious consideration.

Some of the advantages urged by the early advocates of one medical school for the three services are as follows: economy in construction and operation; a better faculty, as the best instructors could be obtained irrespective of the service in which they belonged; *esprit de corps,* which would include not one but all the regular medical establishments; increase in prestige; and better understanding between the various services so that possible friction at points of contact might be prevented. The question of economy is a difficult one to settle without trial. Doubtless, some economy could be effected so far as bricks and mortar and equipment are concerned. This would not be so very great, however, and it is believed would be offset by other disadvantages which will be mentioned in a moment. Economy in

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operation would, of course, be absolutely dependent on how many combined courses could be given. We are apparently agreed, though this is by no means the opinion with all nations, that it is best for our medical officers to receive instruction from civilian medical schools. After this the purpose of our preliminary instruction is twofold. First it is found necessary to supplement school instruction in some particulars, and second the instruction given is wholly special according to the service concerned. There could, therefore, be no economy effected in the latter particular. So far as the former is concerned the proposed combination has something to be said in its favor, yet not so much after all as in some respects, with better teaching in civilian school these courses may be minimized in number. Moreover, the supplementary teaching would naturally differ for the different services. From what has been said it should be clear that while the faculty might consist of the pick of the various medical services, yet this would not greatly benefit the pupils from the various services, as they would necessarily be taught by their own in any event. *Esprit de corps* is rather an elusive thing at the best; it may, perhaps, be well to grant at once that something, but not a great deal, would be accomplished in this direction. Doubtless, there would be some increase of prestige in the public mind. Without the slightest intention of minimizing the value of public opinion, however, it is a question whether this would operate for good in the strictly military services at least. There are so many other factors involved that reforms must be effected in great part from within. Still, it may be admitted that some advantages would result from the combined school so far as increased prestige is concerned. Possible future friction can hardly be avoided by any plan. Clash of interests will probably always result in some friction. Such an Association as this, where members of the various services are brought into close personal contact and so learn each other's points of view under the best auspices, would appear to be of much more value than any school.

The objections to the combined school are many. In the first place, the present schools are doing such splendid work that it is doubtful if the chiefs of the regular medical establishments could ever be induced to favor the combination. Naturally, too, with satisfactory conditions at present they would hardly be

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inclined to favor a plan which would involve considerable differences of opinion in regard to control, administration, etc.

With very weak arguments in favor of the combination and the almost certain hostility of those responsible and in power, it can hardly be regarded as practical. With the collapse of the combined school all other plans dependent upon it would of course fall to the ground.

To specialization may be ascribed all the great advances of the present day in every line of endeavor. Probably within the services we have not gone as far in this direction as will be indicated by lessons of the future. Certainly, the work of the various regular medical services is not enough alike to permit any combination in instruction or duties which will be of benefit. This, of course, does not mean that each cannot help the others to mutual advantage. This was clearly brought out at our recent meeting, and all of us certainly hope that the instances cited only mark a beginning in this important direction.

What was the total strength of the Confederate Army will ever remain a mooted question, for there is no such exact data as that for the Union forces, upon which to base an accurate conclusion. Certain things we should know: the population of the Southern States in 1860, from which might be deduced the theoretical results of voluntary enlistment and the drastic conscription which was said to "rob the cradle and the grave," 17 to 50 years, and the present survivors. From the number of the latter actuarial tables would enable us to calculate what proportion those alive to-day bear to those living in 1861-65.

Nevertheless, so many modifying factors enter into the equation that estimates of the total enrollment vary between a half million and three times that number.

* In a recent publication written in reply to Charles Francis Adams' statement that "the actual enrollment of the Confederate Army during the entire four years of the conflict exceeded 1,100,000 rather than fall short of that number," Dr. McKim contends that half this would better indicate the total strength of that army.

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*"The Numerical Strength of the Confederate Army," Randolph H. McKim, D. D., LL. D., D. C. L., late 1st Lieut., and A. D. C., 3d Brigade, Army of Northern Virginia. 72 pages. The Neale Publishing Co., New York

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The author's conclusions are reached through several lines of argument presented with the scholarly cogency expected of so able and distinguished an advocate, but possibly might be strengthened by the actuarial method above suggested.

It is of interest to military medical officers to know that 74,508 is given as the number dead from battle casualties and 59,277 from disease, a rate per thousand of 124 and 99, respectively, for 600,000 strength. In the Union Army deaths from disease were twice the number of those from wounds, while the total mortality was more than double that estimated for the Confederates.

J. V. R. H.

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OBITUARY CAT.

MAJOR GENERAL ROBERT MAITLAND O'REILLY, United States Army, retired, who died in this city on November 3, was Surgeon General of the Army from September 7, 1902, to January 14, 1909. He was born at Philadelphia January 15, 1845, his parents being John and Ellen (Maitland) O'Reilly. His ancestors settled in Pennsylvania before the Revolution, being a branch of the distinguished Irish family to which belonged that General O'Reilly who was Captain General of Cuba, and at one time Spanish Governor of Louisiana.

He began the study of medicine while still a youth and was appointed an acting medical cadet at the Cuyler General Hospital at Philadelphia in the summer of 1862. As medical cadet he served in the field hospital of the 1st army corps at Gettysburg and in 1864 with the Army of the Cumberland and at the headquarters of General Thomas. After the capture of Atlanta he was ordered to General Hospital No. 3 on Lookout Mountain. In November, 1864, he was ordered back to Philadelphia, where he served in various hospitals until his discharge, when he matriculated at the University of Pennsylvania, from which he graduated in 1866, the centennial year of that institution.

In May, 1867, he entered the Medical Corps of the Army and served in Arizona, Nevada, New Mexico, Colorado, Nebraska and Wyoming, during the next eight years. He was on duty in Washington from 1882 to 1889, and again from 1893 to 1897, during both of which tours of service he was the family physician and intimate friend of President Grover Cleveland. The outbreak of the Spanish-American war found General O'Reilly, a major, doing duty as post surgeon at Fort Wayne, Mich.,

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and he accompanied the 19th infantry from that post to Mobile, Ala., where he was appointed chief surgeon of the first independent division. On May 20, 1898, having been commissioned lieutenant colonel and chief surgeon of volunteers, he became chief surgeon of the 4th army corps, with which he served at Tampa, Fla., and Huntsville, Ala. He served in Cuba from November 16, 1898, to November 11, 1899, being most of that time chief surgeon of the division. Upon his return to the United States he was stationed at Fort Monroe, Va., and at San Francisco as chief surgeon, Department of California, until September 7, 1902, when he was appointed surgeon general of the Army.

The changes and advances which he effected during the six years and four months of his incumbency of that office will always make it memorable in the history of the medical department. The Spanish war had found the medical department of the Army, in common with the other staff departments, quite inadequately equipped both in personnel and material to meet its obligations, and in spite of much excellent work accomplished with the inadequate means at its disposal it was severely criticized. General O'Reilly determined to make a careful study of the grounds for such citicism and to make systematic efforts to remedy the defects discovered. The material for such a study was at hand in the report of the Dodge Commission, appointed by President McKinley, to study the conduct of the Spanish war, which in the course of its investigation had given special attention to the medical department and accumulated a large mass of evidence from every available source concerning it. The conclusions of the commission were embodied in seven recommendations, which contemplated a reorganization of the commissioned medical corps, the establishment of a volunteer hospital corps in time of war, a reserve corps of trained women nurses, an adequate accumulation of medical supplies for war, the charge of transportation by the medical department to such an extent as would secure prompt shipment of medical supplies, simplification of administrative paper work and such legislation as would enable medical officers to draw from the subsistence department the necessary funds for the proper feeding of the sick. So far as these recommendations could be carried out by administrative authority General O'Reilly set methodically to work to do so.

The entire medical equipment was thoroughly overhauled, all unserviceable material eliminated and separate depots for field medical supplies were established, at which assembling of these

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supplies went on steadily and continuously as rapidly as the supplies could be purchased, and every cent which could be saved from the appropriation was devoted to this purpose. The result is that the medical department will in future be enabled to equip its hospitals and field units much more rapidly than they can be organized and their personnel brought together. The relations of the medical department with the Red Cross were studied and arranged. The questions of transportation were solved. The details of record and correspondence were simplified. A new system of subsistence for the sick developed, and last, in point of time, after four years of persistent and determined effort, the medical corps was reorganized in a satisfactory and effective manner.

In connection with this reorganization the creation of a medical reserve corps was a measure not foreseen by the commission, which has added greatly to the capacity for expansion of the medical corps in time of war.

Although the system of immunization against typhoid fever, which is now producing such admirable results in the Army, has been developed and adopted during the administration of the present surgeon general, General O'Reilly was always proud of the fact that he organized and was president of the board of distinguished scientists which recommended to the War Department the experimental adopion of anti-typhoid vaccination.

The first symptoms of the disease from which he died were observed while he was still in active service, and for some years he has lived a very retired and quiet life. Few men are mourned by so many or such devoted friends. His exquisite courtesy and refinement, his wide scholarship, and the wit, which is the gift of his race, gave him a charm which was acknowledged by all who came within the circle of his acquaintance and which was increased by his personal comeliness.

He was interred at Arlington by the side of his only son on the morning of November 5, 1912, with full military honors, the escort being commanded by General Albert L. Mills. The committee of the order of Loyal Legion and a host of friends attended the funeral services.

J. R. KEAN.

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NEWS OF THE SERVICES

Captain Daniel P. Card, Medical Corps, will be relieved from duty in the Philippines on January 15th and will return to the United States by way of Europe, availing himself of a two months' leave en route.

Captain Perry L. Boyer, Medical Corps, who has recently been on duty as Assistant Instructor on Hygiene at the United States Military Academy, West Point, is in Washington on leave of absence, at the expiration of which he will join his new station, Madison Barracks, New York.

Captain Mahlon Ashford, Medical Corps, is in Washington on leave of absence from Fort D. A. Russell, Wyoming.

1st Lieutenant George M. Edwards, Medical Corps, who has been on duty at West Point for the past two years, will sail for the Philippines December 5th.

1st Lieutenant Chester R. Haig, Medical Corps, recently assistant to the Attending Surgeon in Washington, joined his new station at the United States Military Academy, West Point, New York.

1st Lieutenant C. A. Betts, Medical Reserve Corps, recently joined his station at Fort Yellowstone, Wyoming.

Captain William A. Powell, Medical Corps, who has been in the Yellowstone Park with the 1st Cavalry during the summer, has returned to his station, the Presidio of San Francisco, California.

Lieutenant Colonel James D. Glennan, Medical Corps, Commanding Officer of the Letterman General Hospital, San Francisco, California, is spending a month's leave in Washington. Colonel Glennan is a guest at the Army and Navy Club.

Captain William R. Davis, Medical Corps, has joined his station at Schofield Barracks, Hawaii, from Fort Porter, New York.

Lieutenant Colonel Henry I. Raymond, Medical Corps, sailed from San Francisco, California, on the November transport en route to Schofield Barracks, Hawaii.

1st Lieutenant William L. Sheep, Medical Corps, recently reported for duty at the Letterman General Hospital, San Francisco, California.

1st Lieutenant James F. Johnston, Medical Corps, has been assigned to duty at Fort McDowell, California, relieving Captain Herbert C. Gibner, Medical Corps, who goes to Vancouver Barracks for station.

1st Lieutenant Roy C. Hefflebower, Medical Corps, is spending a leave of absence in Washington, preparatory to sailing for duty in the Philippine Islands.

Major Frederick M. Hartsock, Medical Corps, left Fort Wayne, Michigan, on leave of absence, at the expiration of which he will join his new station at Fort Leavenworth, Kansas.

Captain Charles F. Craig, Medical Corps, on duty at the Army Medi-

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cal School, left that station November 10th en route to Jacksonville, Florida, for the purpose of representing the Army at the meeting of the Southern Medical Association.

1st Lieutenant Robert Lemmon, Medical Reserve Corps, has resigned from the service.

A board of officers of the Medical Corps, to consist of Colonel Charles Richard, Lieutenant Colonel Walter D. McCaw, Major Powell C. Fauntleroy, Major Carl R. Darnall, Major Frederick F. Russell, Major Charles R. Reynolds, Major Paul S. Halloran, Captain William T. Davis, Captain Charles F. Craig, Captain William A. Wickline, Captain William A. Duncan, Captain Henry J. Nichols, and Captain Arthur C. Christie, is appointed to meet at the Army Medical School, 721 Thirteenth Street, N. W., this city, at the call of the senior officer of the board, to determine the results of the preliminary examinations of applicants and for the final examination of candidates for admission to the Medical Corps. The junior member of the board will act as recorder.

1st Lieutenant Samuel S. Creighton, Medical Corps, has been relieved from duty with Field Hospital No. 3 and assigned to duty at Fort Leavenworth, Kansas.

1st Lieutenant Daniel F. Maguire, Medical Corps, is availing himself of a leave of absence before sailing for the Philippines in December.

1st Lieutenant William H. Thearle, Medical Corps, under orders for the Philippines, will sail on the December 5th transport.

Major Leigh A. Fuller, Medical Corps, has been ordered from Fort Leavenworth, Kansas, and directed to proceed to Fort Brady, Michigan, for duty.

Major Reuben B. Miller, Medical Corps, on the expiration of his present leave of absence, will take station at Fort Wayne, Michigan.

Major George H. Crabtree, Medical Corps, on leave from Culebra, Canal Zone, Panama, is visiting in Jamaica.

1st Lieutenant Harry H. Van Kirk, Medical Corps, recently reported for duty at the Presidio of Monterey, California, for duty.

Captain Charles E. Freeman, Medical Corps, is conducting a party of insane patients from the Letterman General Hospital, San Francisco, California, to the Government Hospital for the Insane,—St. Elizabeth.

Captain Samuel J. Morris, Medical Corps, is in Washington on leave of absence, at the expiration of which he will return to his station, the Letterman General Hospital, San Francisco, California.

Major George H. R. Gosman, Medical Corps, U. S. Army, Tokyo, Japan, has been admitted into the Imperial University Post-Graduate course in public medicine, state medicine, hygiene, sanitation, bacteriology, etc. Major Gosman is the first European ever to have been accorded this honor. The lectures, etc., are all in the Japanese language.

Announcement has been made of the marriage of Assistant Surgeon General W. C. Rucker, of the Public Health Service, to Mrs. Elizabeth Harwood Miller, of Washington, November 11, 1912.

Surgeon Hugh S. Cumming, of the Public Health Service, has been

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ordered to make an examination of the prevalence of tuberculosis, trachoma and other contagious and infectious diseases among the Indians at the Hampton Normal Institute at Hampton, Virginia.

Passed Assistant Surgeon Joseph Goldberger, of the Public Health Service, has been recently investigating an epidemic of dengue existing at various points in Florida.

Passsd Assistant Surgeon Hugh de Valin, of the Public Health Service, who has been on duty at the Marine Hospital at San Francisco, California, was recently ordered to the Marine Hospital in Chicago, Illinois.

Assistant Surgeon J. P. Leake, of the Public Health Service, has been ordered to investigate into the prevalence of tuberculosis, trachoma, and other contagious and infectious diseases among the Indians in the State of New York.

Sanitary Science at Tulane University, New Orleans, La.

Three series of courses in Sanitary Science were started at Tulane this Session. These courses are for Medical, Science and Engineering students specializing in Sanitation. The Medical graduate in this course expects to become the Health Officer on Boards of Health; the Science graduate becomes the expert on Sanitary biology and the Engineering graduate will eventually design, build and care for structures for sanitary purposes.

To give courses in Sanitary Engineering a University must have departments in medicine and engineering on one campus. Many Universities either have no medical department or that department is located in some distant city. Tulane is fortunate in this and many other respects. The engineering and sanitary laboratories are on the same campus; the School of Tropical Medicine is located at Tulane, the Charity Hospital clinics having over one thousand beds—with its consequent wealth of medical material—is at its service.

Tulane is an endowed institution, having over one thousand students. It is free of political or religious control. It was one of the first institutions to comply with the Carnegie Foundation entrance requirements.

In the senior class of the Sanitary engineering course instruction will be given in water supply, framed structures and reinforced concrete construction by Professor Donald Derickson, recently professor in post-graduate courses in reinforced concrete at Cornell University. Instruction and laboratory work in Sanitary microbiology will be given by Professor Creighton Wellman and his assistants in the School of Tropical Medicine.

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ARMY MEDICAL CORPS EXAMINATIONS.

THE Surgeon General of the Army announces that preliminary examinations for the appointment of First Lieutenants in the Army Medical Corps will be held on January 20, 1913, at points to be hereafter designated.

Full information concerning these examinations can be procured upon application to the "Sugeon General, U. S. Army, Washington, D. C." The essential requirements to securing an invitation are that the applicant shall be a citizen of the United States, shall be between 22 and 30 years of age, a graduate of a medical school legally authorized to confer the degree of Doctor of Medicine, shall be of good moral character and habits, and shall have had at least one year's hospital training as an interne, after graduation. The examinations will be held simultaneously throughout the country at points where boards can be convened. Due consideration will be given to localities from which applications are received, in order to lessen the traveling expenses of applicants as much as possible.

The examination in subjects of general education (mathematics, geography, history, general literature, and Latin) may be omitted in the case of applicants holding diplomas from reputable literary or scientific colleges, normal schools or high schools, or graduates of medical schools which require an entrance examination satisfactory to the faculty of the Army Medical School.

In order to perfect all necessary arrangements for the examination, applications must be completed and in possession of the Adjutant General at least three weeks before the date of examination. Early attention is therefore enjoined upon all intending applicants. There are at present thirty-five vacancies in the Medical Corps of the Army.

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REMOVAL

Notice is given that the address of the new Secretary of the Association of Military Surgeons and of the Military Surgeon will be changed after December 31, 1912, and all communications should thereafter be addressed to

CHICAGO, ILLINOIS

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